

# GLOBAL



*Instruction manual control box  
Global WF-1867 DD-AUT*

# Important safety instructions

## Work environment

- Use 220v AC in  $\pm 10\%$  ranges.
- Please keep the product away from the high electromagnetic interference.
- Please operate in the area which temperature is  $5^{\circ}\text{C} \sim 45^{\circ}\text{C}$ .
- Please operate in the area which humidity is 80% or less.
- Please keep the product away from the flammability and exploder.

## Notice of installation

- The control box should be installed correctly follow the instruction in this manual.
- Turn off the power and unplug the cord before installation.
- To wire must not set to be near the wheel and other movable parts.
- To avoid the static interference and current leakage, all grounding must be done.

## Notice of safety

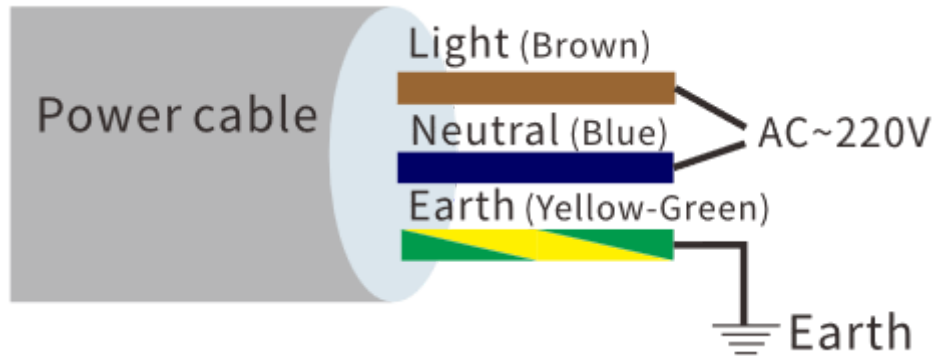
- Turn off the power before maintenance and repair or raising the machine arms, or changing needle, or threading needle.
- Do not open the box except the professional.
- When turn on the controller in the first time, use low speed to operate and check the correct rotation direction.
- During machine operation, don't touch any moving parts.
- All moving parts must use the protective device to avoid the body contact and objects insertion.
- When there is water or other liquid, or caustic material on box or motor, you must stop operation and turn off the power.
- All connector shouldn't be plug and unplug when power on.
- The connector should be plug and unplug in the correct method.

# Assembly instructions

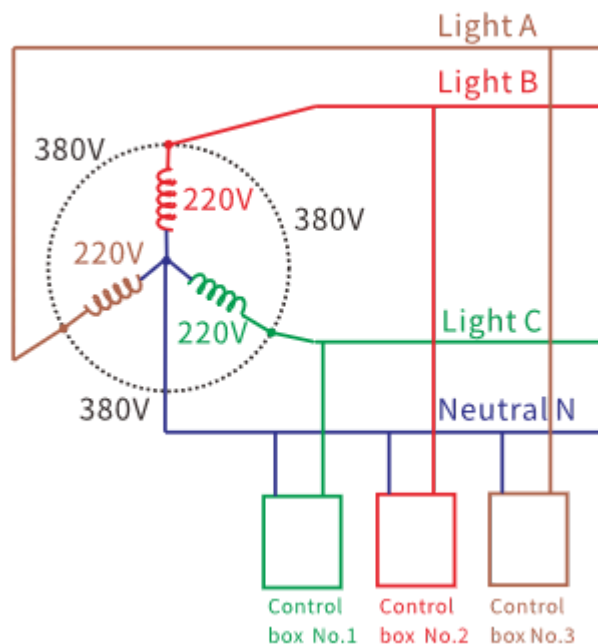
## Electrical connection

Work on the electrical equipment may only be performed by qualified technicians or personal who have undergone the necessary training. The power supply is AC 220v.

Single phase:220v power connection



Three phase:380v power connection



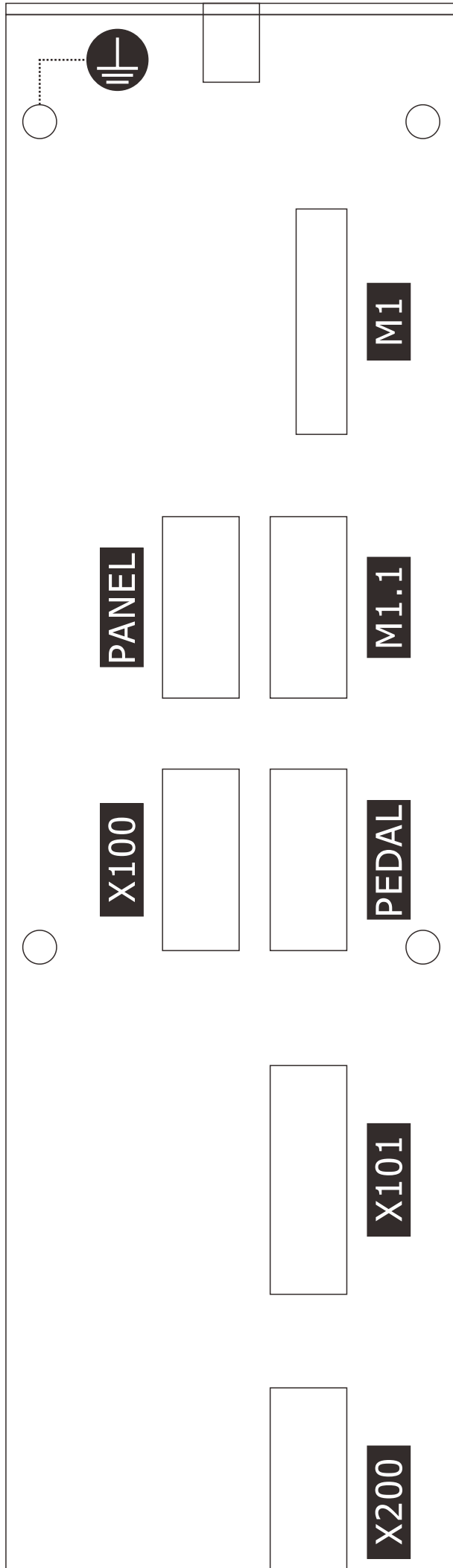
### ⚠ Caution

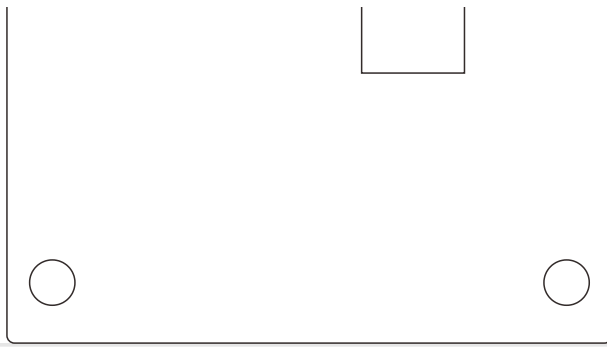
Yellow-green earth cable must be connected to the earth properly.

Otherwise there are risks of human electric shock and the controller doesn't work properly sometimes

# Wiring diagram

## Back of the controller

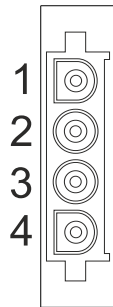




Tag	Meaning
M1	Motor Power
M1.1	Motor encoder
PANEL	Touch panel
PEDAL	Pedal
X100	Expansion signal port
X101	Signal port
X200	Solenoid (valve) output port

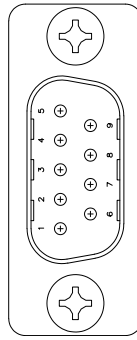
## Interface Pinout

### M1



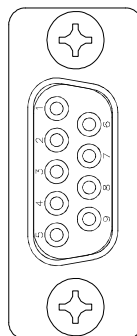
Pin	Define
1	EARTH
2	A phase
3	B phase
4	C phase

## M1.1



Pin	Define
1	GND
2	VCC
3	MC-U
4	MC-W
5	MC-CHA
6	-
7	MC-SYNC
8	MC-V
9	MC-CHB

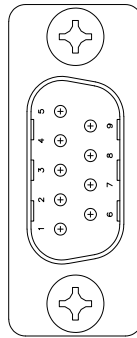
## PANEL



Pin	Define
1	-
2	CANL

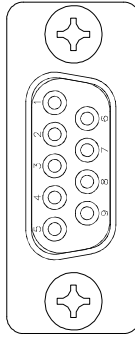
Pin	Define
3	HMI-RXD
4	VCC
5	GND
6	CANH
7	HMI-TXD
8	VCC
9	GND

## PEDAL



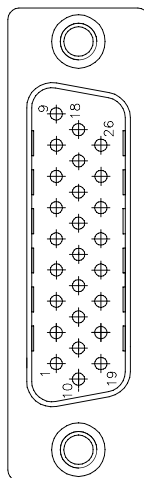
Pin	Normal pedal	Standing pedal	SPI
1	GND	GND	GND
2	VCC	VCC	VCC
3	Pedal-AN	Pedal-AN	INT2
4			SPI-SCK
5		Trim	SPI-MISO
6		Start/Stop	INT1
7		Foot	INT3
8			SPI-NSS
9			SPI-MOSI

## X100



Pin	Define
1	EXT-SYNC
2	CANL
3	UART-RX
4	VCC
5	GND
6	CANH
7	UART-TX
8	VCC
9	GND

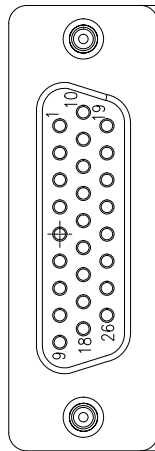
## X101



<b>Pin</b>	<b>Define</b>
1	VCC
2	Keypad-LOCK
3	MACHINE ID-CLK
4	Keypad-CLK
5	CHB2
6	Input-04(digital)
7	Input-03(digital)
8	ElecHandWheel-CHB
9	ElecHandWheel-CHA
10	GND
11	GND
12	
13	Keypad-DATA
14	CHA2
15	MACHINE ID-SDA
16	Input-06(digital)
17	Input-05(digital)
18	Input-02(digital)
19	DC12v
20	DC12v
21	Input-10(analog)
22	Input-09(analog)
23	Input-08(analog)

Pin	Define
24	Input-07(analog)
25	Keypad-Key
26	Input-01(digital)

## X200





Pin	Define
1	DC31v
2	Output-02
3	Output-01
4	Output-03
5	Output-04
6	Output-05
7	Output-06
8	Output-07
9	Output-10
10	DC31v
11	Output-02
12	Output-01


Pin	Define
13	Output-03
14	Output-04
15	Output-05
16	Output-06
17	Output-07
18	Output-10
19	DC31v
20	Output-02
21	Output-01
22	DC31v
23	Output-09
24	Output-09
25	Output-08
26	Output-08

## Touch panel

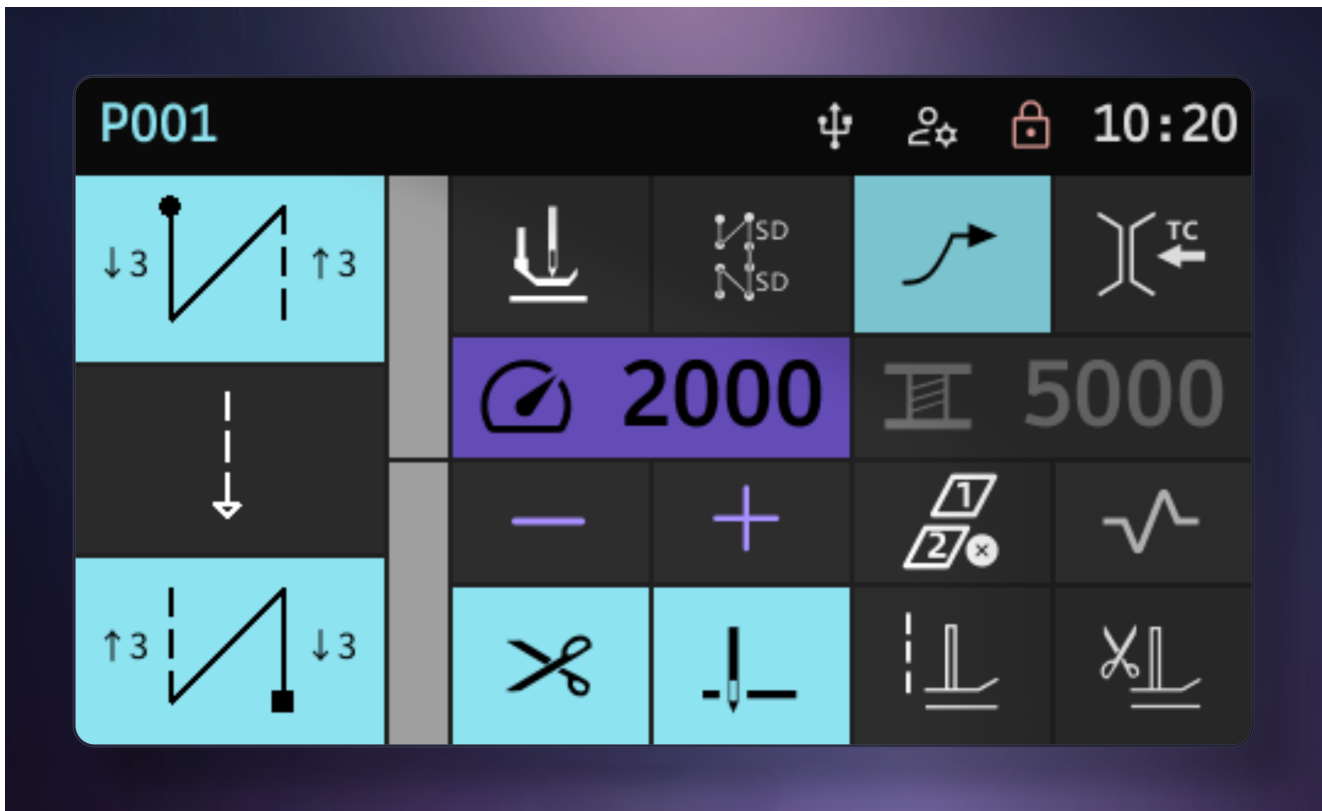
### Physical buttons

There are three physical buttons on the right side of the touch screen.

Icon	Name	Description
	BtnLock	Lock/unlock the screen, the touch screen can only be operated when it is unlocked.
	BtnSet	Enter the setting interface

Icon	Name	Description
	BtnReturn	Return to the previous interface


## Main sewing interface






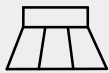



The **Main Sewing** interface is divided into two parts: the top is the **Status bar**, and the rest is the **Sewing function area**.

### Status bar


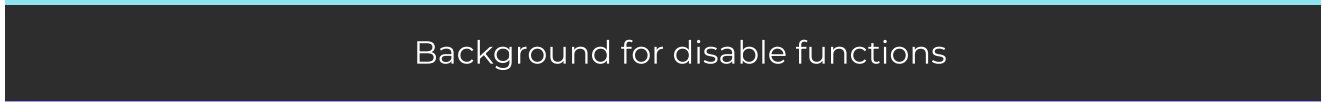

The status bar displays some information about the current system, such as whether a USB device is inserted, whether standing pedal is connected, the screen lock status, time, etc.


Icon	Description
P001	Currently selected sewing program
	USB device plug-in


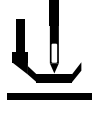




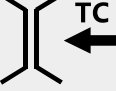

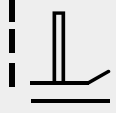
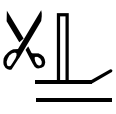


Icon	Description
	Touch screen lock status, locked
	Touch screen lock status, unlock
	Current user permission level: Operator
	Current user permission level: Technician
	Current user permission level: Developer
	Standing pedal connected
	time

## Sewing function area

In this area of operation, icons are given different background colors. These colors have their own meanings. Some general rules are as follows:

	Background for enabled functions
	Background for disable functions
	Background or accent color for UI that is highlight

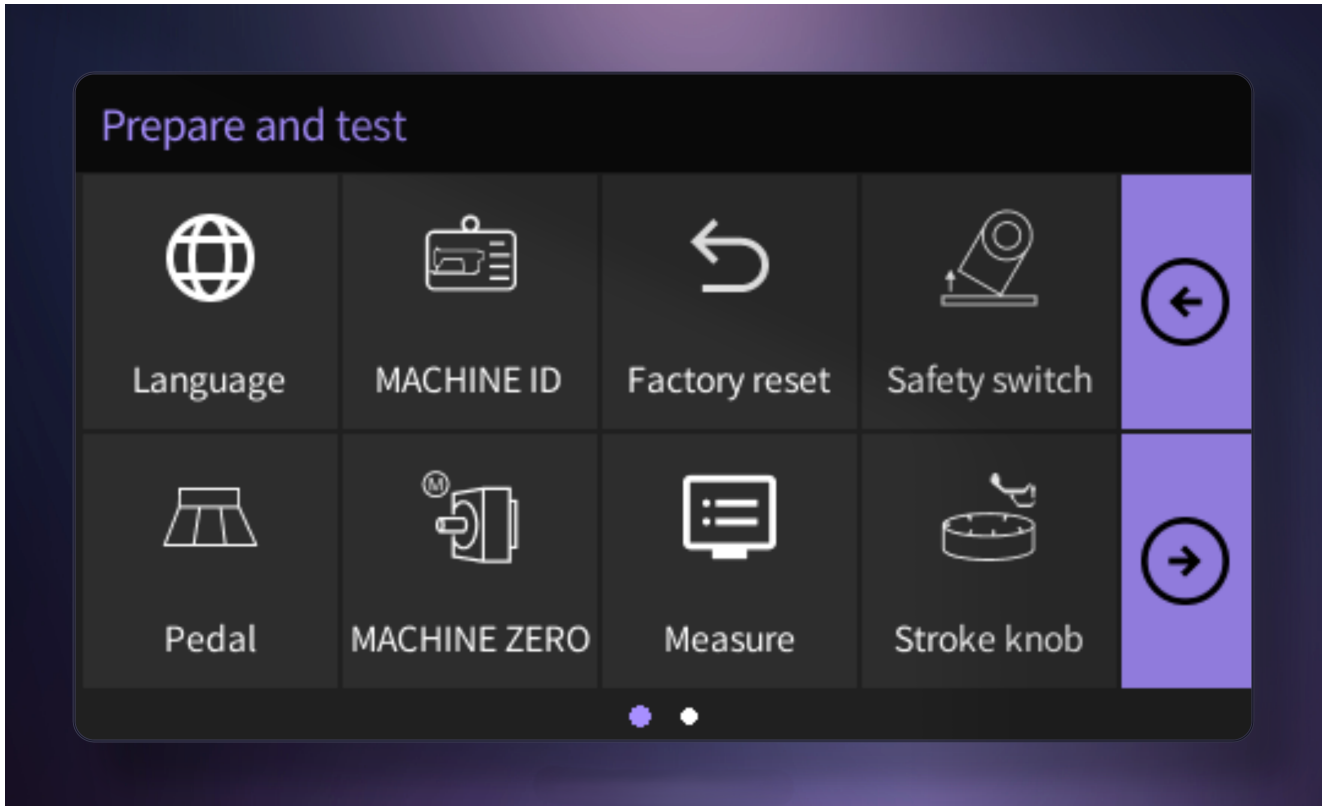
Icon	Description
	Position of the needle when sewing stops: in the material

Icon	Description
	Position of the needle when sewing stops: upper needle position
	Turn back, reversal motor after cutting the thread
	SD mode for backtack at seam begin
	SD mode for backtack at seam end
	SD mode for both backtack at seam begin/end
	Soft start
	Thread clamp
	Thread trimmer
	Sewing foot lift at sewing stop
	Sewing foot lift after trim/at seam end
	Sewing Max. Speed
	Bobbin thread counter






# Preparation and test











## How to enter the interface

Press **BtnSet** when switching on the controller, enter **Preparation and Test** interface.



The list of items is as follows:

Icon	Description
	Set the touch screen display language, see <a href="#">Set Language</a>
	Set the Machine ID, refer to <a href="#">Set the MACHINE ID</a>
	Factory reset
	Safety switch, such as tilt switch, hook cover removed warning, etc.
	Select the pedal type, either normal or standing

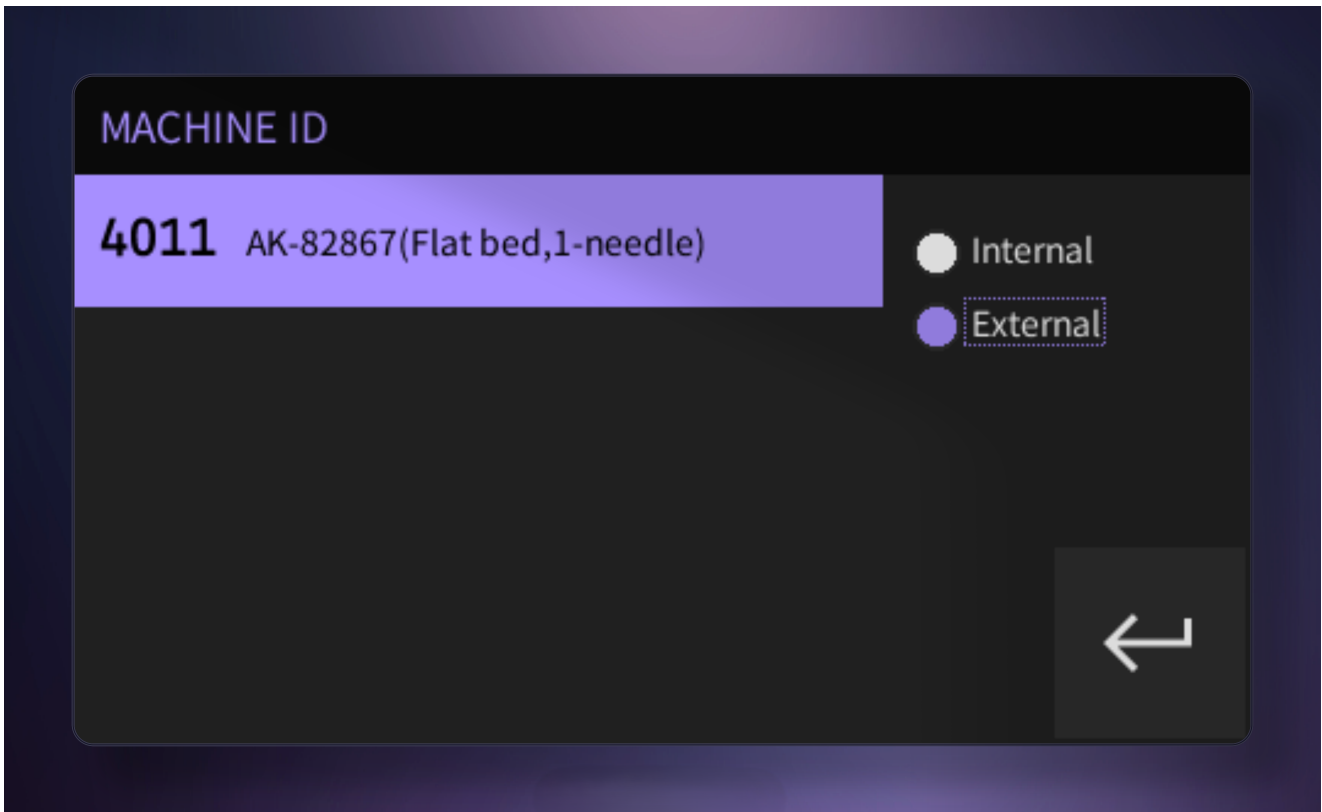
Icon	Description
	Set the MACHINE ZERO, refer to <a href="#">Set the MACHINE ZERO</a>
	Troubleshoot, monitor various input signals of the controller, such as buttons, pedal, motor encoder, etc.
	Calibrate the stroke speed limit potentiometer
	Troubleshoot , test the controller's outputs
	Testing the main motor
	Controller exception code log
	Set date, year, month, day
	Set time, 24-hour clock
	Transferring sewing programs
	About, display software version, date, etc.

## Set the MACHINE ID

### Important

It's very important to make sure you set it correctly.

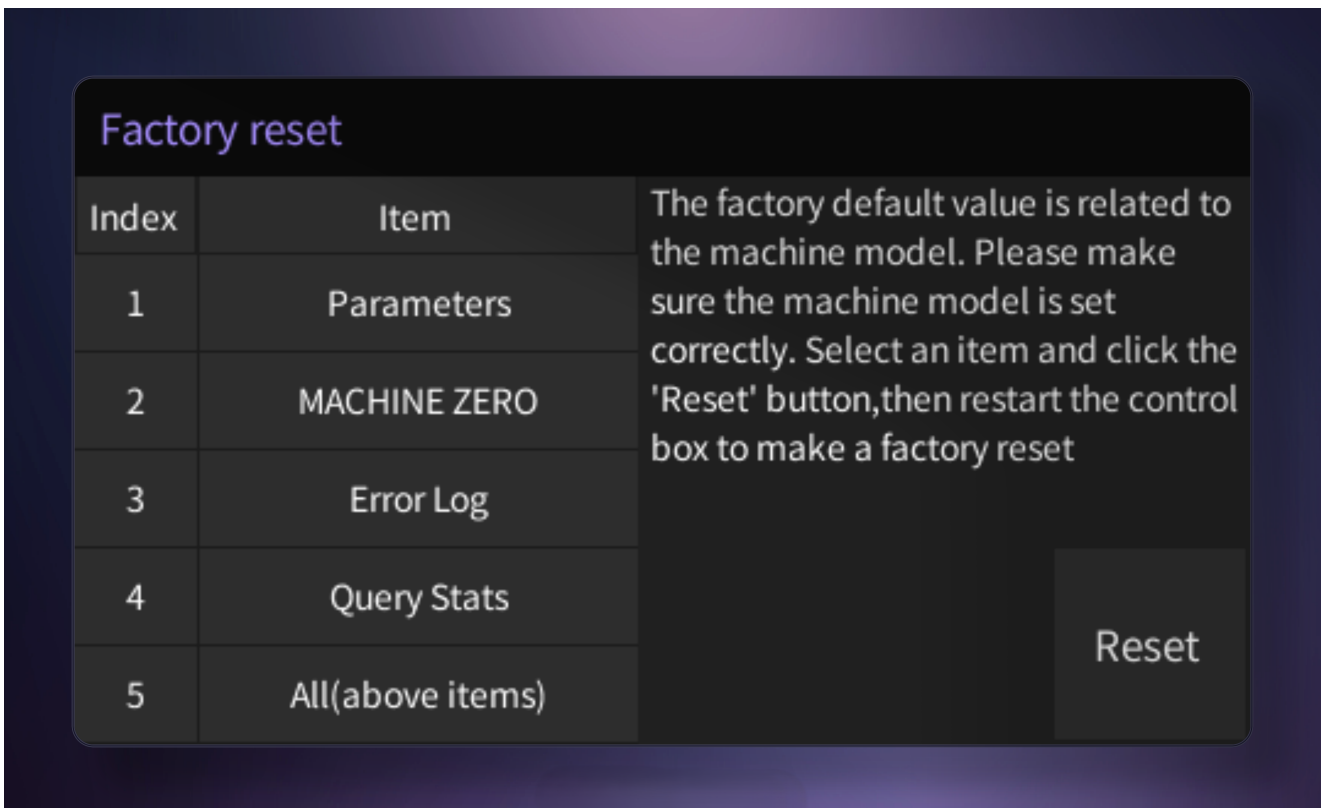
At **Preparation and Test** interface, select the sub-item: **MACHINE ID**.



If the machine type is not set correctly the machine will not work properly. Normally, the control box has different default value with different model such as speed limit and actuator action angle, etc.

## Factory reset

At **Preparation and Test** interface, select the sub-item: **Factory reset**.



Select one of the options from the list on the left, click the Reset button, and then power on the controller again.

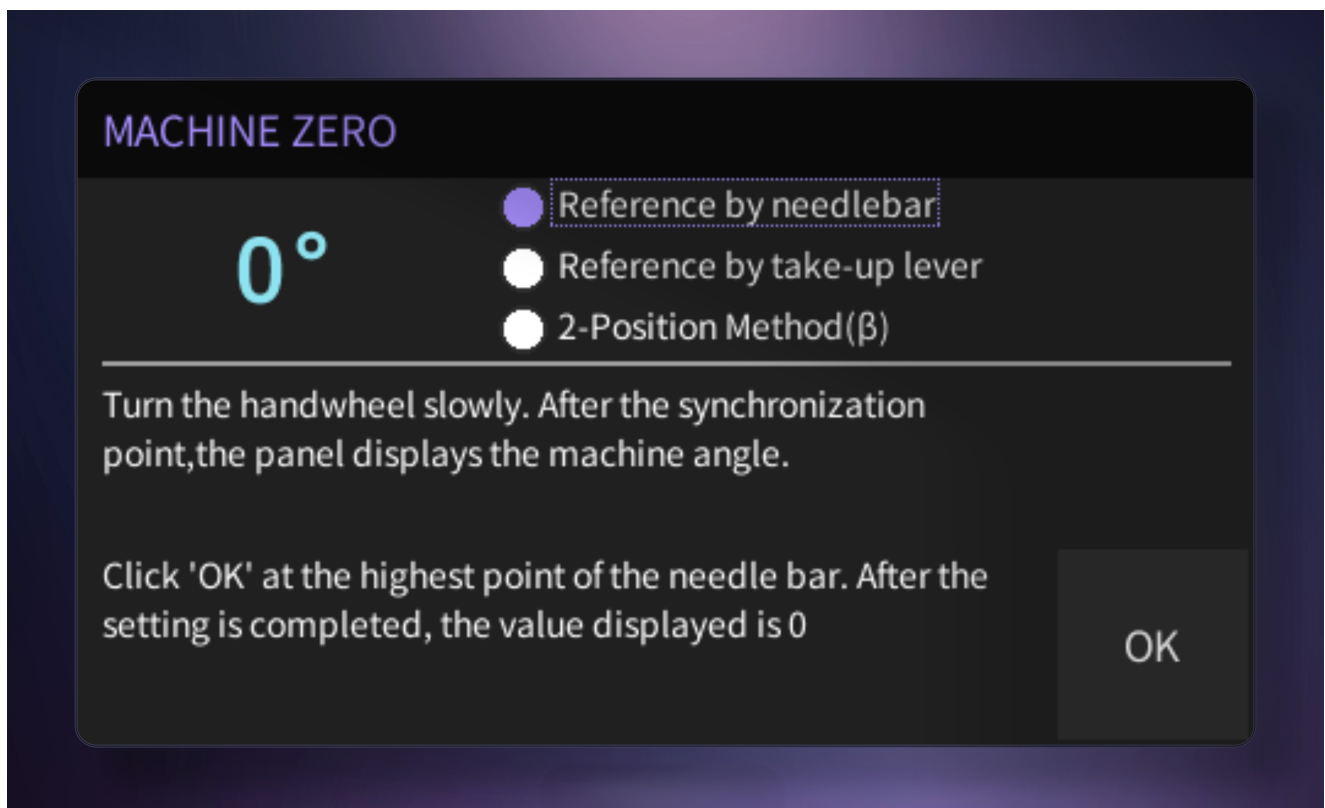
## Set the MACHINE ZERO

The highest point of the needle bar, positions mentioned in this book are based on this, such as the angle of the magnet action/release, where the motor stops, etc.

### Important

It's very important to make sure you set it correctly.

At **Preparation and Test** interface, select the sub-item: **MACHINE ZERO**.



### Reference by needlebar

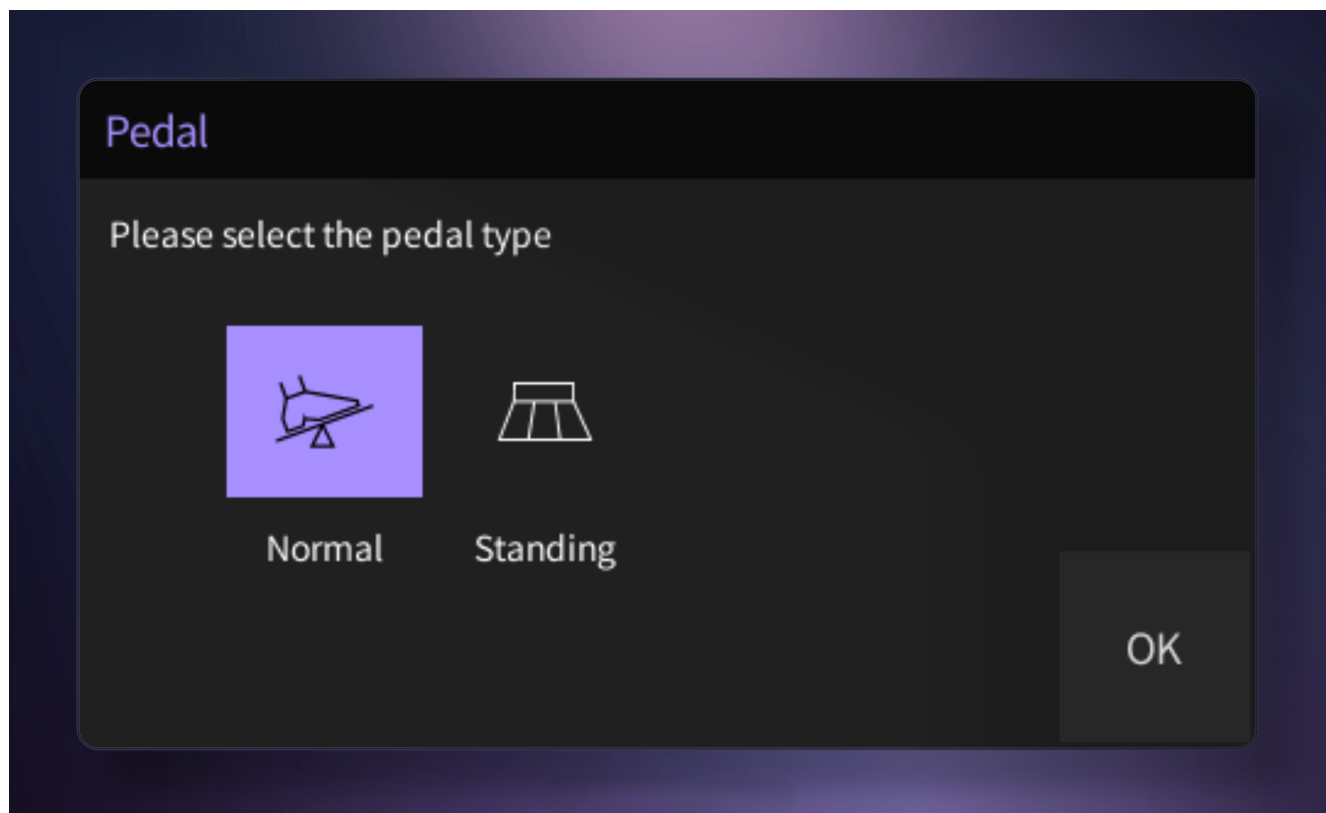
After waiting for the motor angle to synchronize, turn the needle bar to the highest point, this is the direct way.

### Reference by take-up lever

After waiting for the motor angle to synchronize, turn the take-up to the highest point, the controller will identify this position as the upper needle position and reversely deduce the zero position based on the value of **D01**.

## Select the pedal type


At **Preparation and Test** interface, select the sub-item: **Pedal**.



Click OK button to save.

## Inputs test

At **Preparation and Test** interface, select the sub-item: **Measure**.

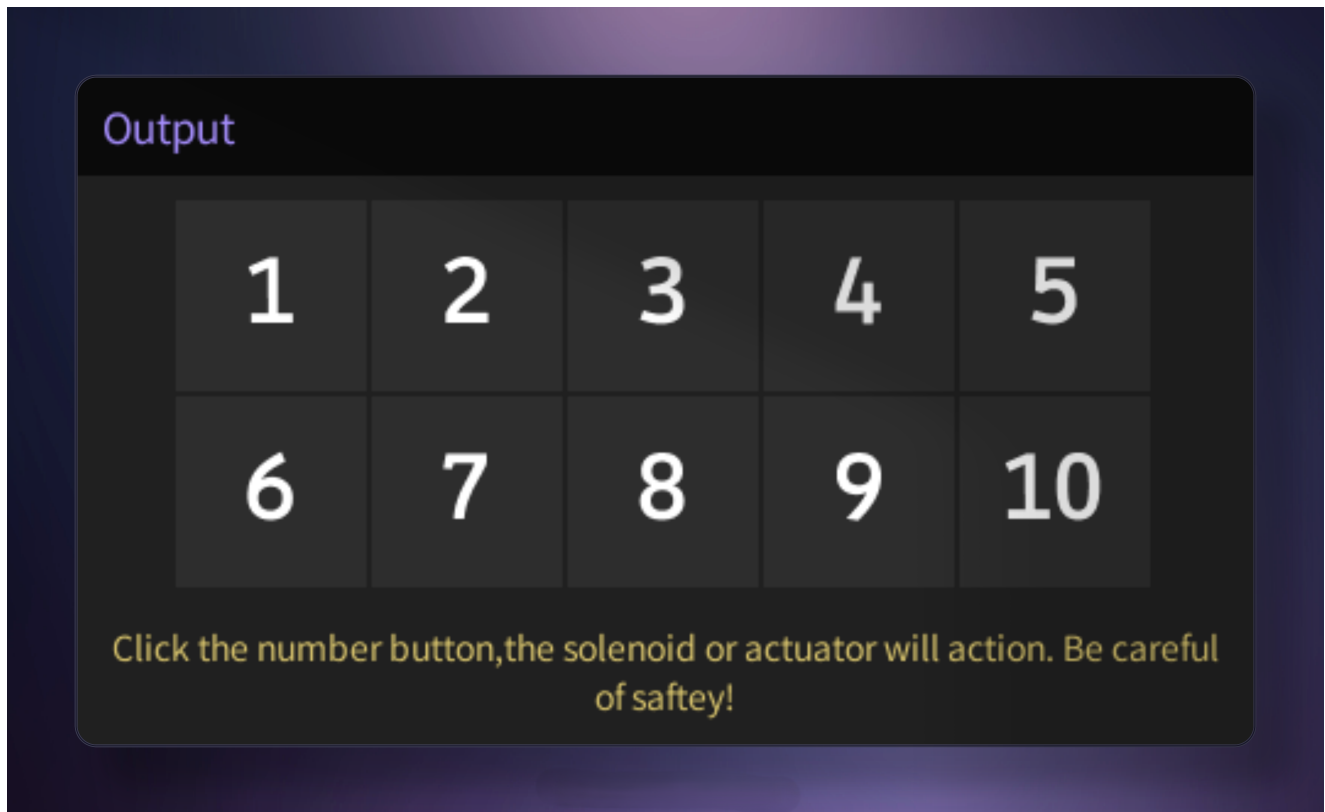


The screenshot shows a dark-themed table titled "Measure". The table has four columns: "Item", "Value", "Item", and "Value". It lists various measurement items and their corresponding values.

Item	Value	Item	Value
AC voltage	220	Electronic handwheel	111
Extern Synchronizer	0	Keypad	6
Index and UVW	1,5	Ia	2047
Raw encoder value	1589	Ib	2065
Motor encoder	0	AN1	256
Pedal	1810	AN2	256
Standing	0 0 0	AN3	256
Input	010101	AN4	256

## Outputs test

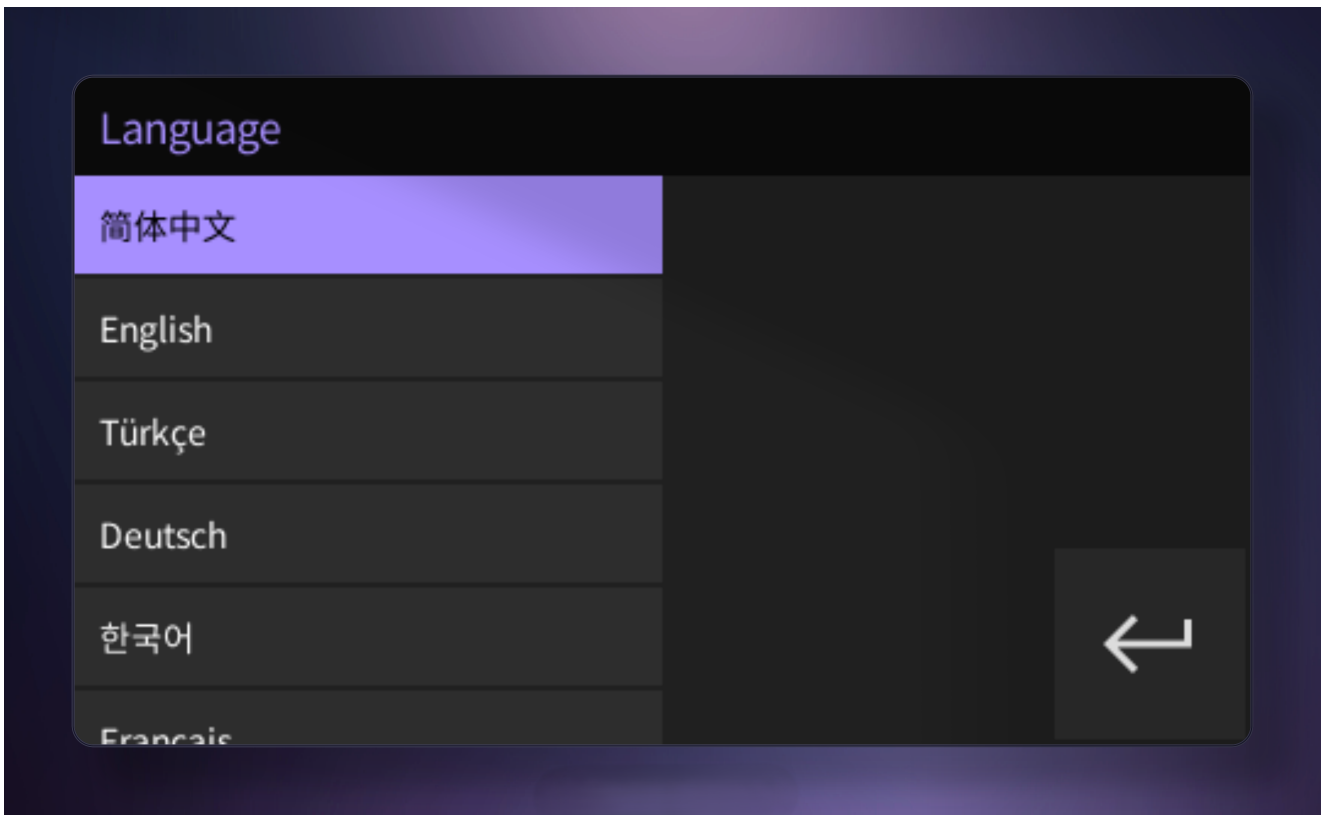
At **Preparation and Test** interface, select the sub-item: **Output**.



There are ten solenoid outputs which labeled as SOL01~SOL10, you can test the solenoid output by touch the number button.

## Set language

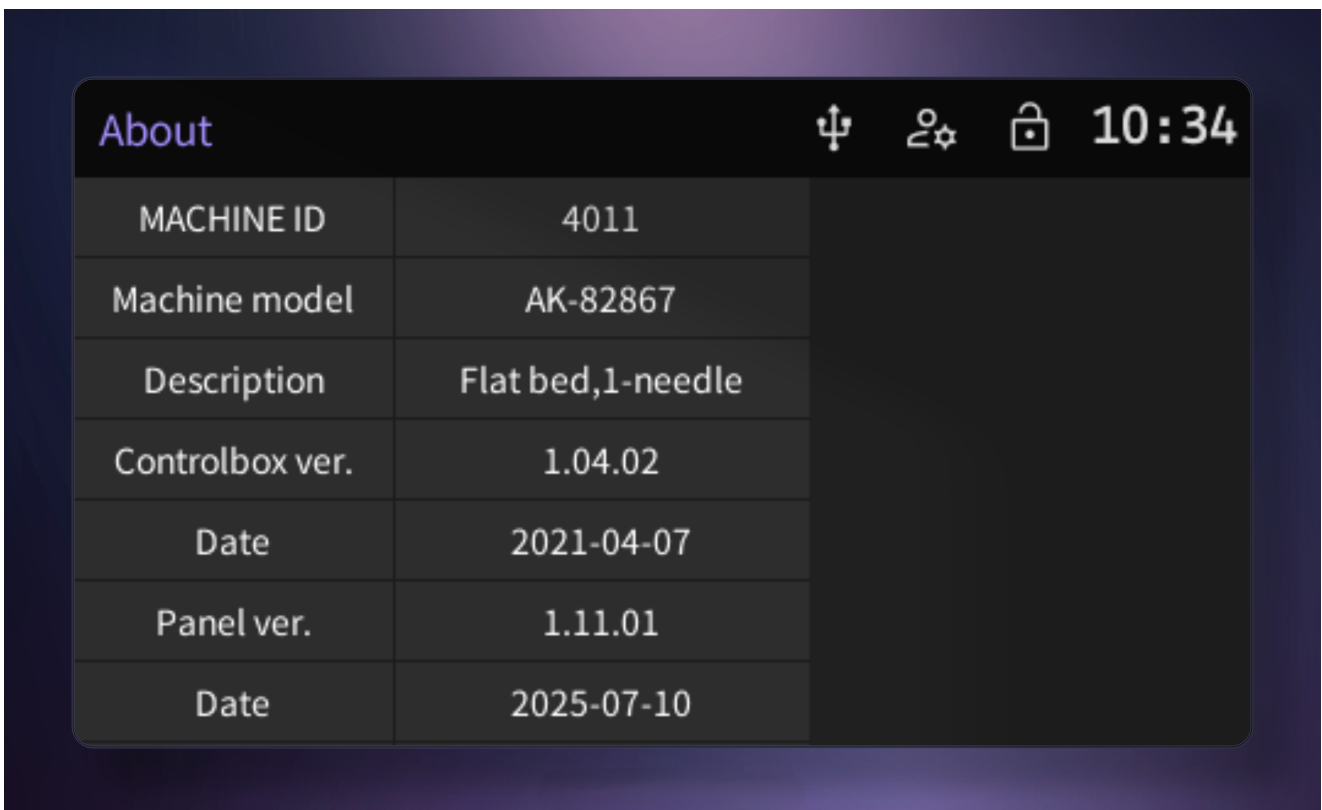
At **Preparation and Test** interface, select the sub-item: **Language**.



Choose the language which you need, touch OK to save, then restart.

## View software version

At **Preparation and Test** interface, select the sub-item: **About**.






As shown in the screenshot above, the software version of the control box is **v1.04.02**, released on 20210407, the software version of touch panel is **v1.11.01**, released on 20250710.

# System operation

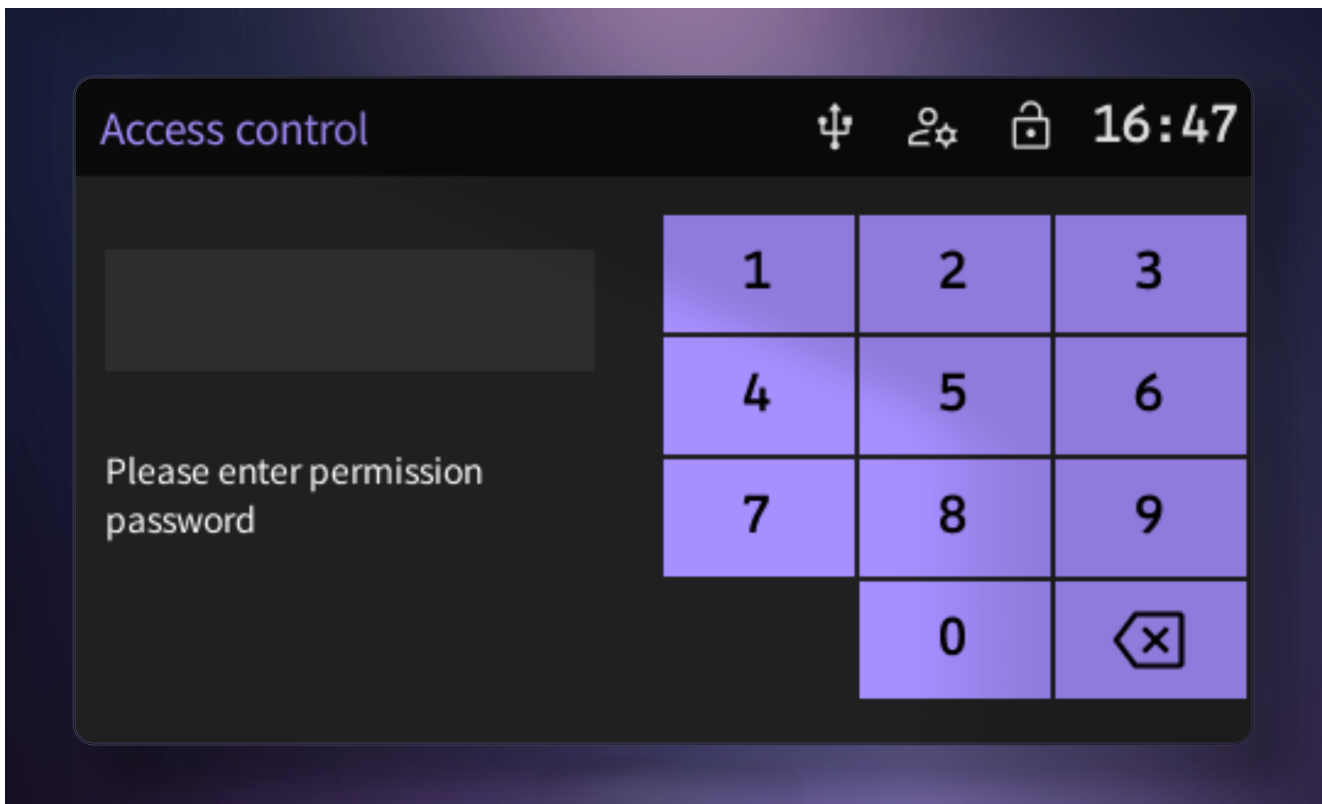
## Access control

### Levels of authority

Icon	Level	Accessible parameter
	Operator	Basic parameters
	Technician	Advanced parameters
	Developer	Parameters about motor drive

### Access rights to the technician's level

Touch the authority icon on the **Status bar** of the screen, enter **Access Control** interface.



After entering the correct password, a success message box will appear, and then the permission icon in the status bar will change.

## Quick reset all parameters

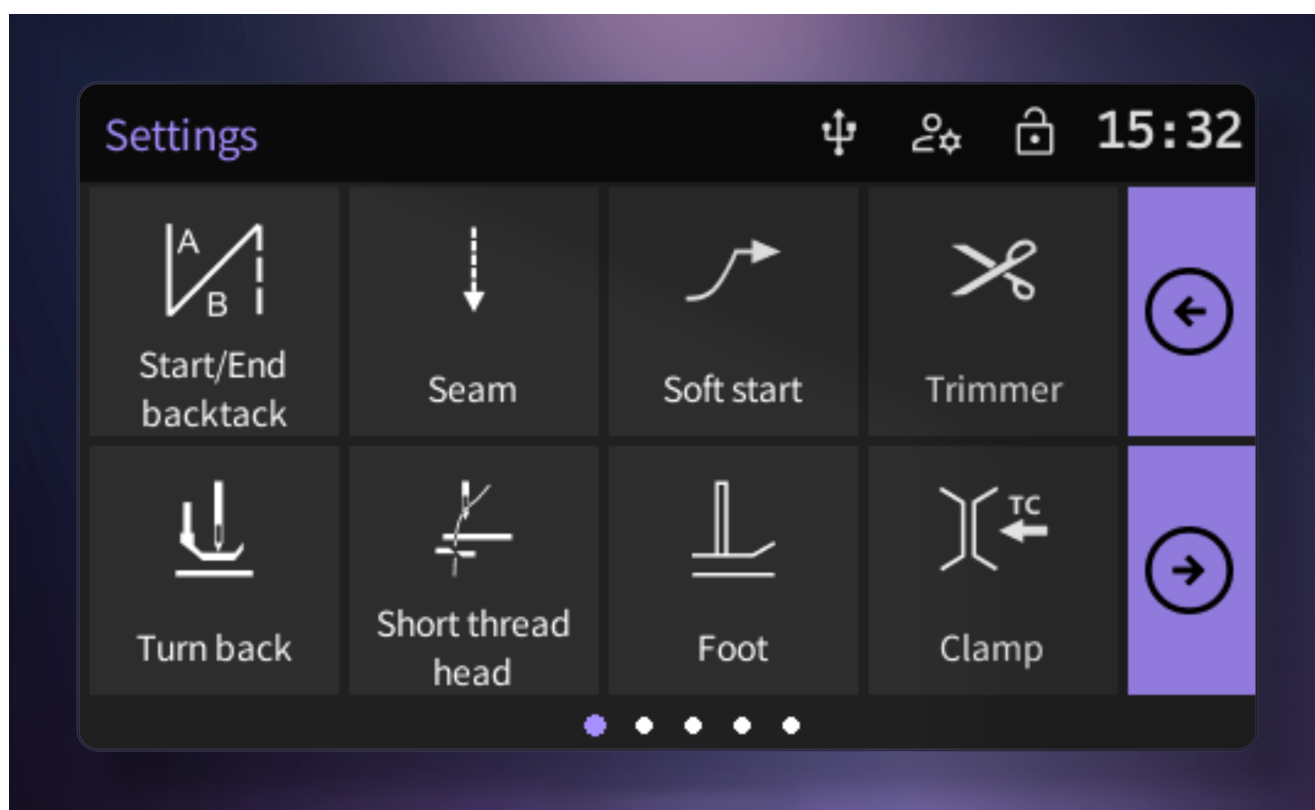
Press **BtnReturn** when switching on the controller, the controller will make a factory reset.

There will be a message at the bottom of the welcome interface, after initialization is completed, you will enter the main sewing interface.

## User settings

### How to enter the interface

At **Main Sewing** interface, press **BtnSet** to enter **Setting** interface.



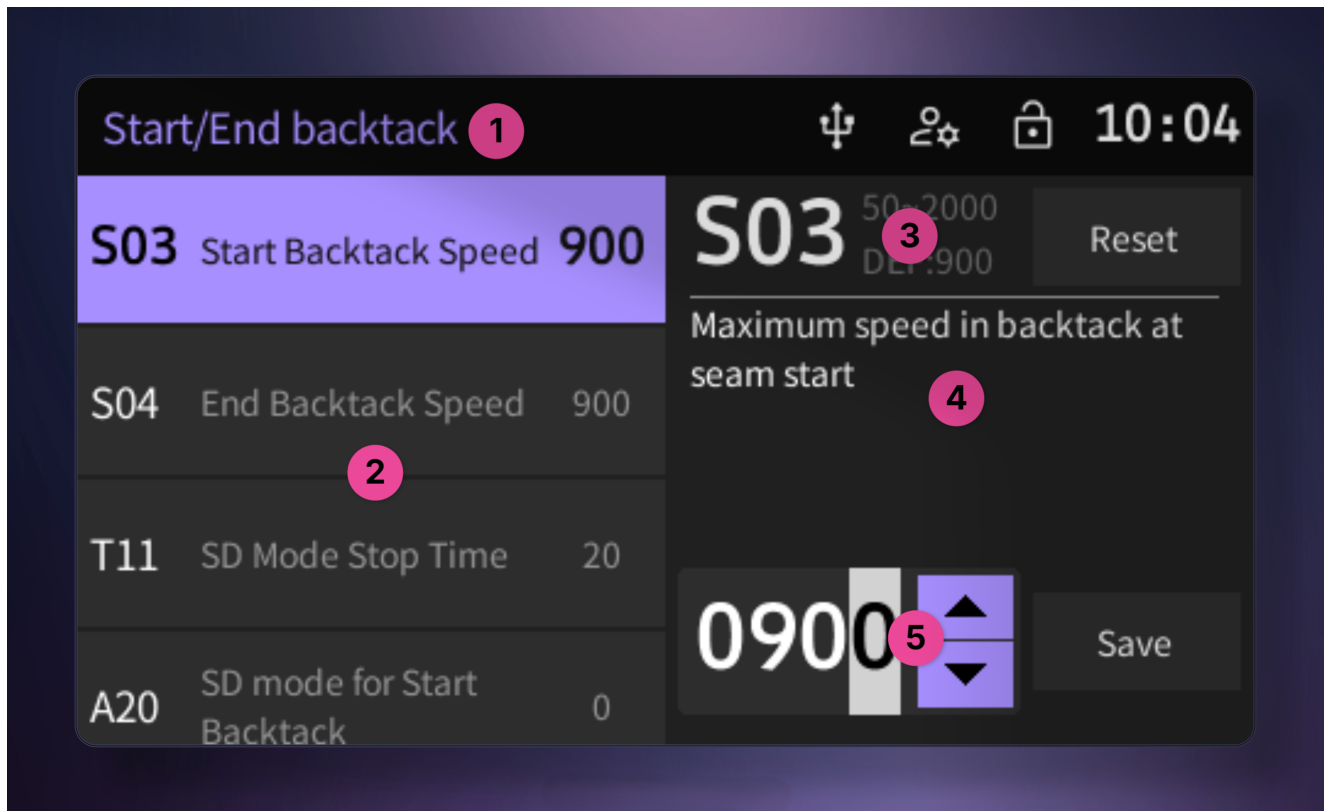
The settings categories shown in the screenshot above depend on the current user permissions.

### Select the function category to be adjusted

At **Setting** interface, you can switch pages by touching the left and right arrows on the right side of the screen. Each page displays up to 8 setting items, which are categorized according to sewing functions.

## Adjust parameter value

Touching the icon of a setting item will enter the lower interface.



### Area Mark 1

Category Name

### Area Mark 2

The parameters included in this category, the currently selected parameter will be highlighted. Each line displays the parameter number, parameter name, and current parameter value. If the current parameter value is not the default value, its current value will also be highlighted.

### Area Mark 3

The adjustable range and default value of the currently selected parameter.

### Area Mark 4

Detailed meaning of the currently selected parameter

### Area Mark 5

Touch the digit of the parameter value you want to adjust, and then touch the arrow.

### Reset button

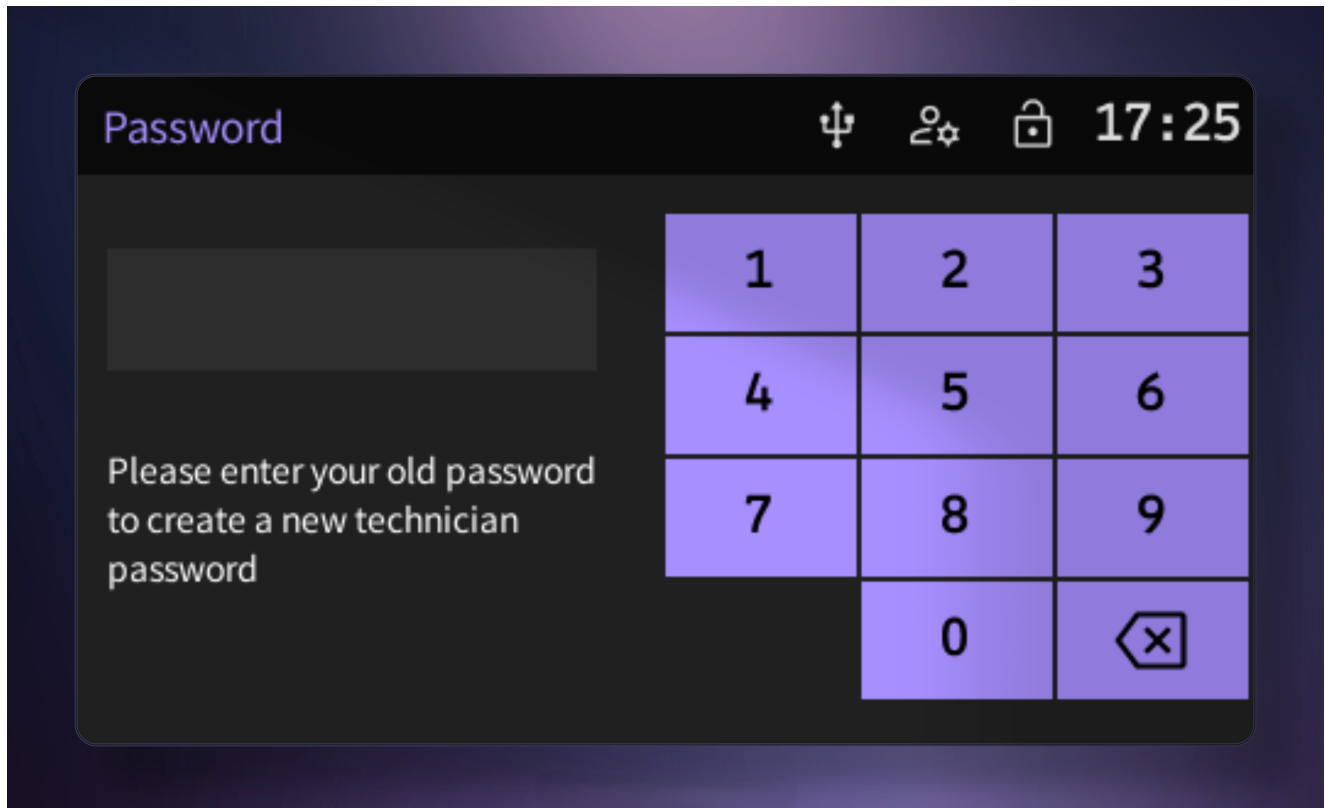
Restore the parameter value to the default value. This step does not save.

### Save button

Touch to save.

## Modify the technician password

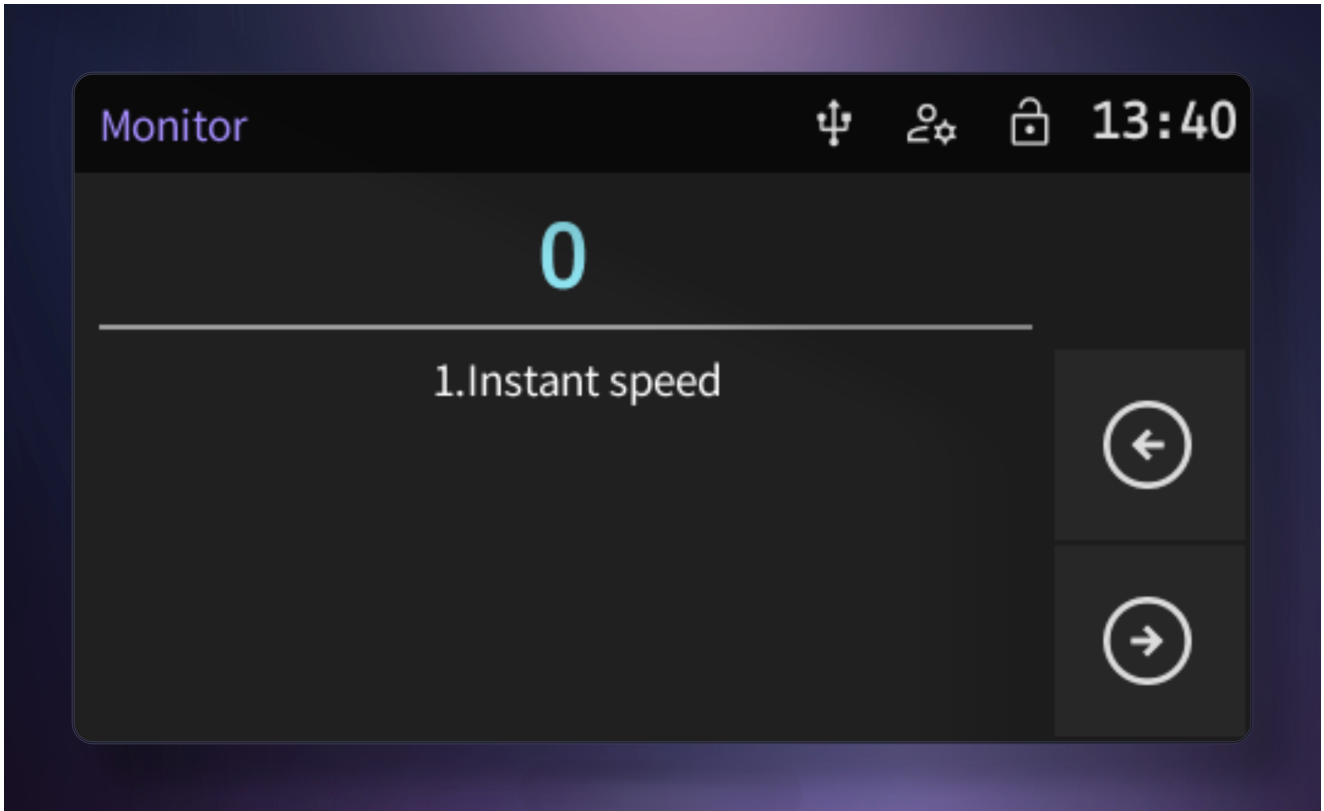
At **Setting** interface, select sub-item: **Password**.



You can set a new password if the old password is entered correctly. the default technician password is 123456.

# Monitor

At **Setting** interface, select sub-item: **Monitor**.



You can select the monitor value by the arrow button. The monitor items are: instant speed, instant angle, raw encoder value, hall sensor of motor, electric angle, stroke knob sensor, etc.

## Settings the Basic Functions

### Start/End backtack

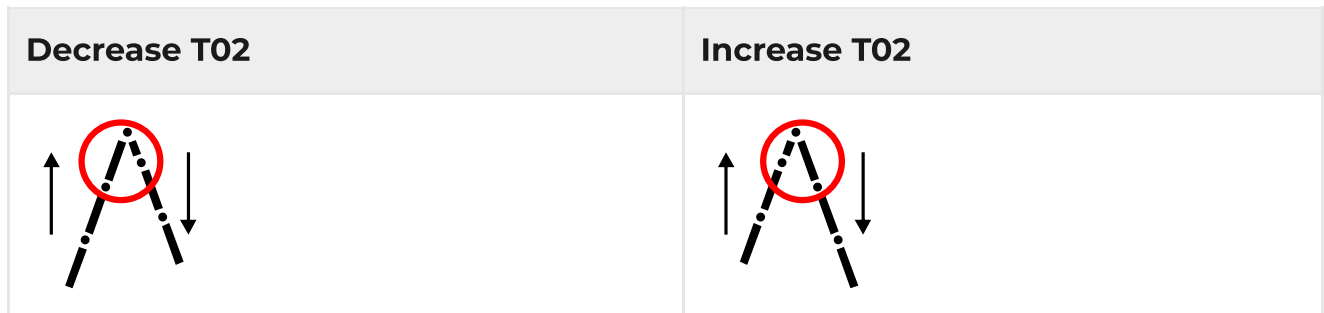
#### Stitch in stitch

Before adjustment, make sure that forward stitch length is the same with backward stitch length use the reverse lever.

The time it takes for reverse actuator actions, adjust parameter T01 as the guide of following figure:



The time it takes for reverse actuator releases, adjust parameter T02 as the guide of following figure:



## SD Mode

SD mode is a special mode of start/end bartack, used to ensure the seam looks better.

When the SD mode is enabled, the motor will pause at the collagen turning point and wait for the time set by **T11** to ensure that the reverse action in place, then the motor continue running.

SD mode can be activated for start bartack or end bartack respectively, controlled by **A20** and **A22**.

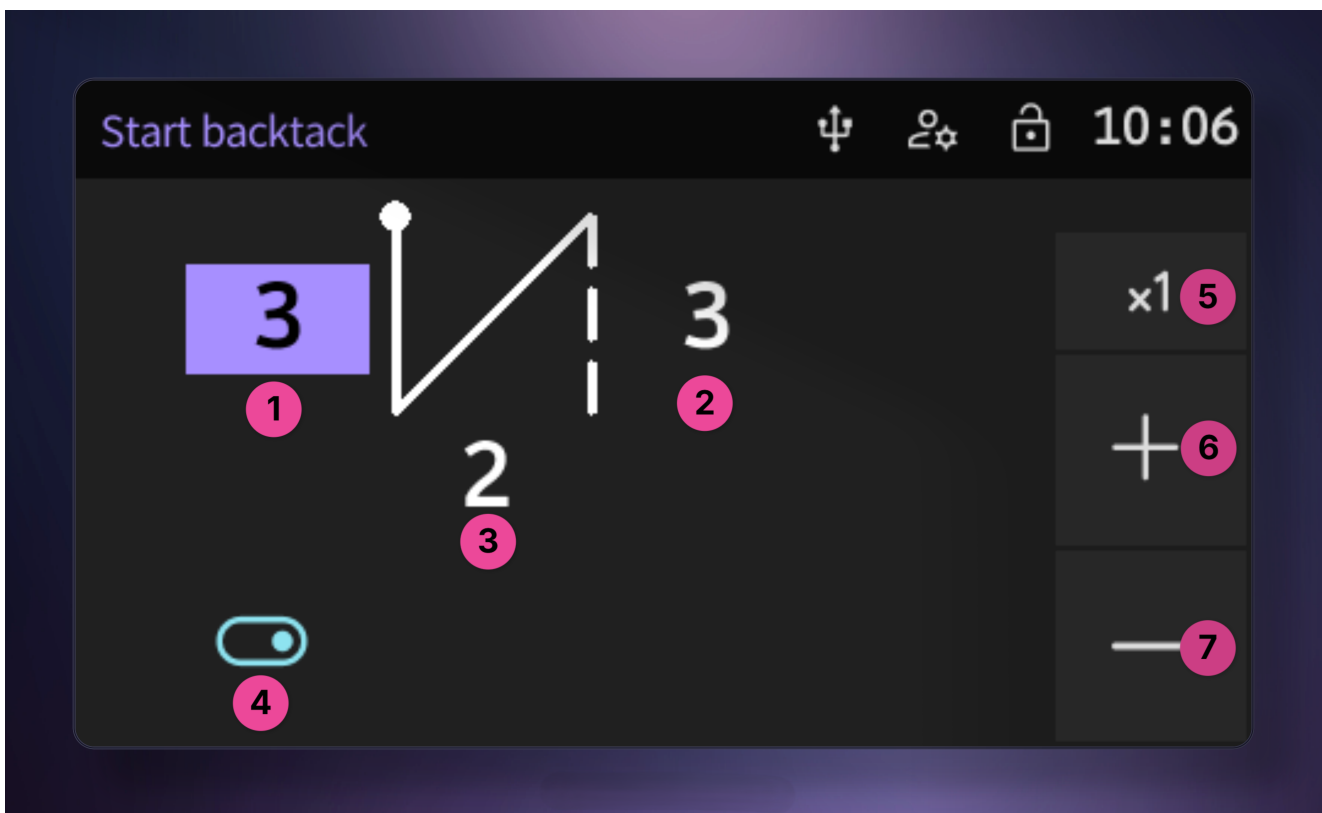
## Quick reference

Index	Max	Min	Unit	Description
S03	2000	500	spm	Speed in backtack at seam begin
S04	2000	500	spm	Speed in backtack at seam end
T01	200	1	ms	Reverse solenoid action time
T02	200	1	ms	Reverse solenoid release time
D05	359	0	°	Reverse power on angle
D06	359	0	°	Reverse power off angle
A20	1	0	-	Ornamental-stitch backtack at seam start 0 = Off 1 = On, the motor will stopped at sewing direction change point

Index	Max	Min	Unit	Description
A22	1	0	-	Ornamental-stitch backtack at seam end 0 = Off 1 = On, the motor will stopped at sewing direction change point
T11	1000	1	ms	Stop time for sewing direction change of individual backtack sections in order to reach the specified stitch lengths(forwards/backwards)

## Editing on touch panel

### Start backtack



#### Area Mark 1

Number of stitches for start backtack section A

#### Area Mark 2

Number of stitches for start backtack section B

Area Mark 3

Set to 1 for single start backtack and 2 for double start backtack

#### Area Mark 4

Start backtack On/Off

### Area Mark 5

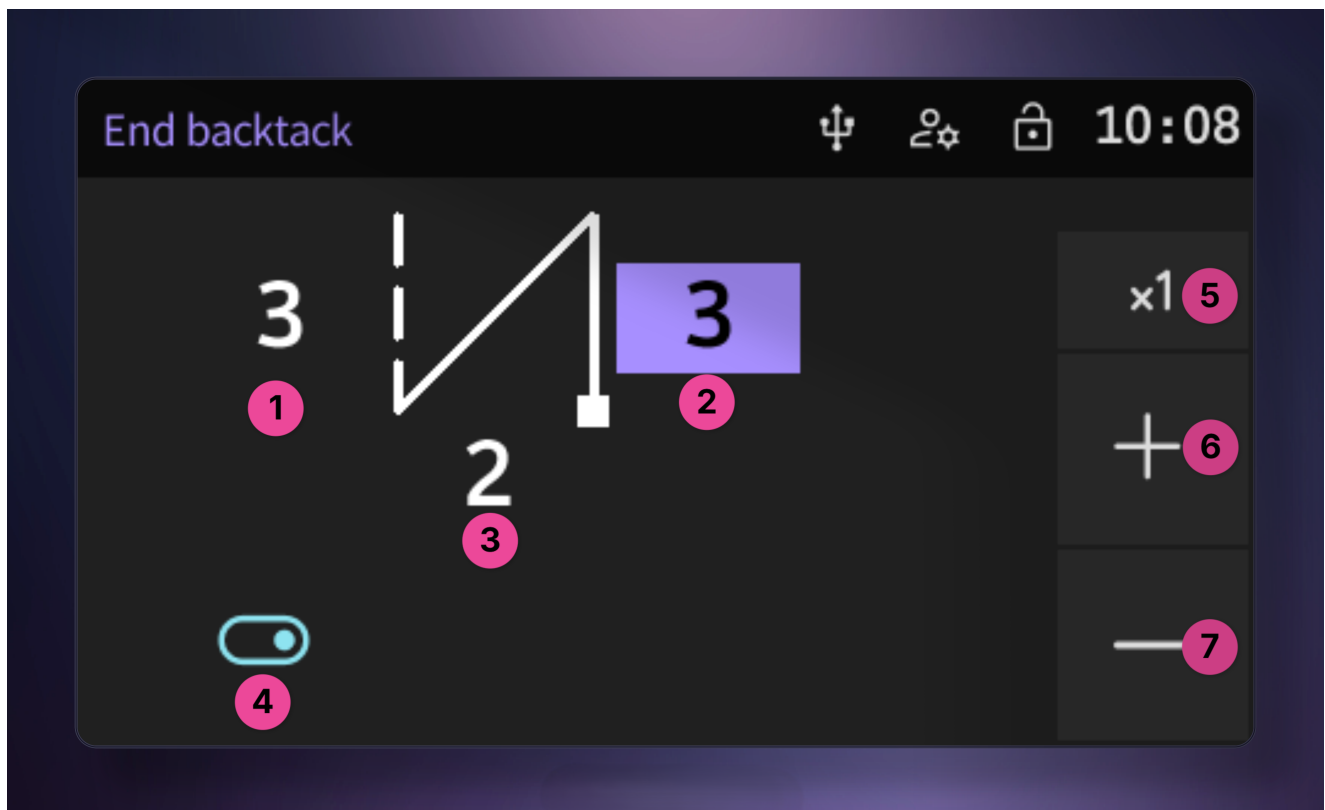
Choose whether the addend or subtractor is 1 or 10

### Area Mark 6 and 7

Operation: Add or subtract

When you are finished editing, press the **BtnReturn** to return to the previous interface.

### End backtack



### Area Mark 1

Number of stitches for end backtack section C

### Area Mark 2

Number of stitches for end backtack section D

Area Mark 3

Set to 1 for single end backtack and 2 for double end backtack

### Area Mark 4

End backtack On/Off

## Area Mark 5

Choose whether the addend or subtrahend is 1 or 10

## Area Mark 6 and 7

Operation: Add or subtract

When you are finished editing, press the **BtnReturn** to return to the previous interface.

# Seam

## Seam

A *seam*, usually is divided into three parts: start backtack, middle sewing, end backtack and thread cutting. A seam starts from stepping on pedal **POSITION 1** for the first time, and ends when stepping on **POSITION -2**.

## Program

A *Sew program*, contains at least one seam. Let's call it *Seam-01*, *Seam-02* ... *Seam-n*, program controls them sewing automatically, when *Seam-n* is finished, program end.

## Program with Free seam

Program with Free seam is a special sewing program, it has only one seam section, and there is no needle limit in the middle section.

## Program with Stitch counting seam

Program with Stitch counting seam is a sewing program that contains up to 25 stitch counting seams, each segments can be programmed with a maximum of 99 stitches.

The functions of the sewing program are divided into two areas: the global functions related to the sewing program and the local functions related to the seam segment.

### Global functions:

- Soft start

### Local functions:

- Number of stitches

- Begin/end backtack
- Thread clamp
- Thread trim
- Needle position when sewing stops
- Automatic elevation of sewing foot when sewing stops
- Automatic elevation of sewing foot after thread trim(seam end)

The seam segment whose stitch number is equal to 0 is considered as the end of the program. If the stitch number of the next segment is 0, the program will return to the first segment.

After any seam section ends, if you step on the pedal **POSITION -2**, the whole program will be ended. If the thread trimming has not been executed at this time, the thread trimming will be executed and return to the first section, otherwise program will be directly returned to the first section.

## Program with W seam

Program with W seam is a special sewing program, it has only one seam section, and there is no start/end tacking, the program will automatic complete when pedal 1 is stepped on.

The segments is programmed as E, range 1~15. The stitches of first segment is defined as A, the stitches of second segment is defined as B, the stitches of other segments are defined as C(forward) and D(backward).

When the program is finished, the pedal must be step back to 0 position and then be step forward to start the next sewing.

## Correction

If **A03** is equal to 0:

When press the key, the needle moves form the current position to the position set by parameter **D15** or **D16**, which one is the closest, the target position is that one.

E.g, current position is 40°, **D15** is 70°, **D16** is 200°, when you press the button, the motion trace is **Position 40° => 70° => 200° => 70° => 200° ...**.

If **A03** is equal to 1:

when you press the button, two cases: if you set stop at upper position, the needle moves from the current position to the position set by parameter **D01**. if you set stop at lower position, the needle moves from the current position to the position set by parameter **D02**:

E.g, current position is 40°, **D01** is 70°, **D02** is 200°, if **A01** is 0, when you press the button, the motion trace is **Position 40° => 200° => 200° => 200° ...** ; if

**A01** is 1, when you press the button, the motion trace is

**Position 40° => 70° => 70° => 70° ...** .

## Working angle range of manual reverse button

For some machine types, if the machine sews in reverse suddenly at certain position, the needle may

break, parameters **D11** and **D12** are to avoid this situation.

If the needle position is greater than **D11** and less than **D12**, the manual reverse button is working.

## Quick reference

This table summarizes which parameter should be used for seam:

Index	Max	Min	Unit	Description
S05	2000	500	spm	Speed of W seam
S06	2000	500	spm	Speed of stitches counting seam
A02	1	0	-	Auto sewing for stitch counting seam
A03	1	0	-	Stop position of correction 0 = Half stitches; 1 = One stitch
A07	1	0	-	Block the Quick Keys
A30	1	0	-	Correction mode: 0 = single correction; 1 = continuous correction.
D01	359	0	°	Upper Needle Position
D02	359	0	°	Lower Needle Position

Index	Max	Min	Unit	Description
D11	359	0	°	Lower Limit of Manual Reverse SW. Working angle range
D12	359	0	°	Upper Limit of Manual Reverse SW. Working angle range
D15	359	0	°	Correction: Upper Position
D16	359	0	°	Correction: Lower Position
O69	1	0	-	Correction timing 0 = The correction is inhibited after thread trim; 1 = No limit

## Programs on Touch panel

Sewing programs are stored in the touch panel.

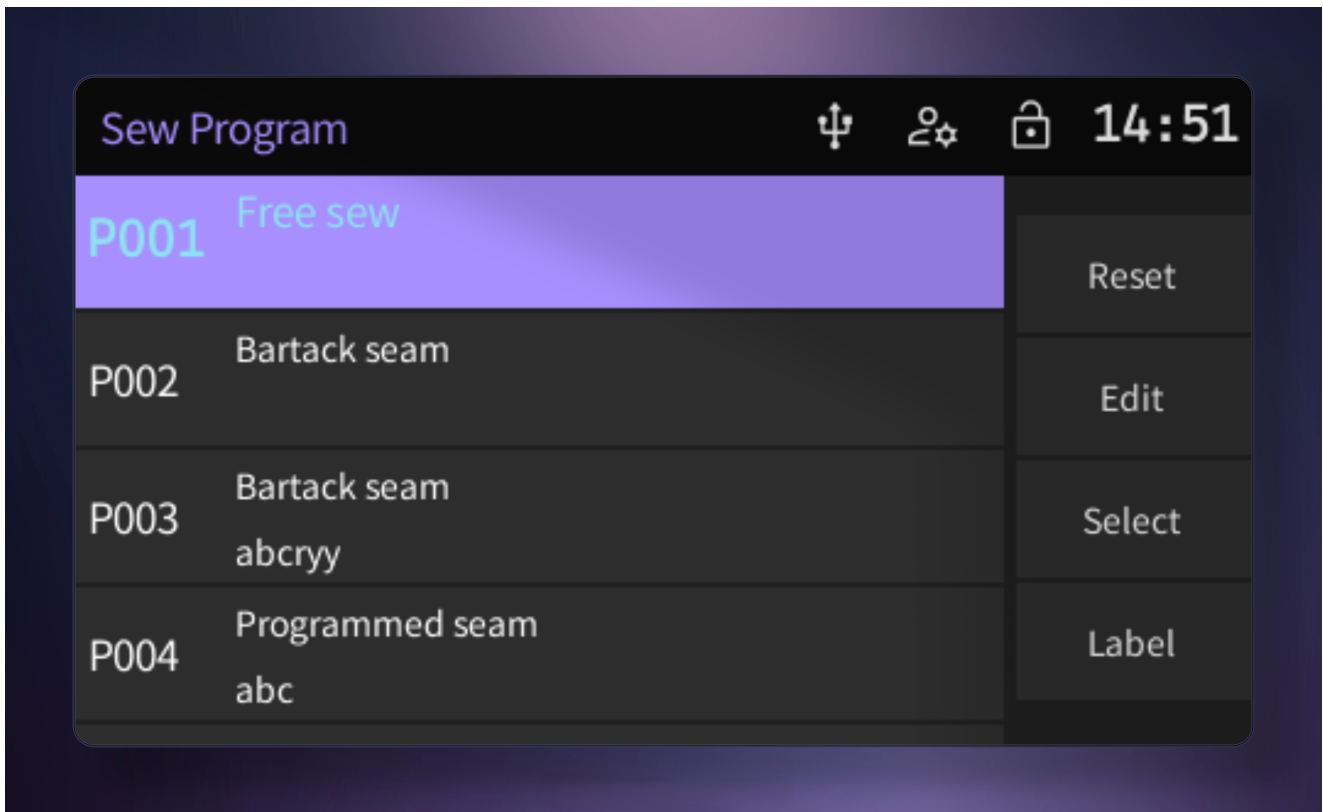
Nine programs can be stored on the operation screen, the locations are P001 to P009,

- P001: this storage location can only save the program with one free seam
- P002: this storage location can only save the program with one W seam
- P003 ~ P009: these seven storage locations can store either the program with one W seam or the program with stitch counting seam.

The user can select any one of them on the operation screen, and the one that is selected is called the **Activated program**, which will be transferred to the control box and saved there.

## How to enter the editing interface

At **Main sewing** interface, touch the program index icon in the upper left corner of the screen, then enter the **Sew Program** interface. In this interface, users can centrally program all sew programs from P001 to P009.



Slide the list on the left, select the required program:

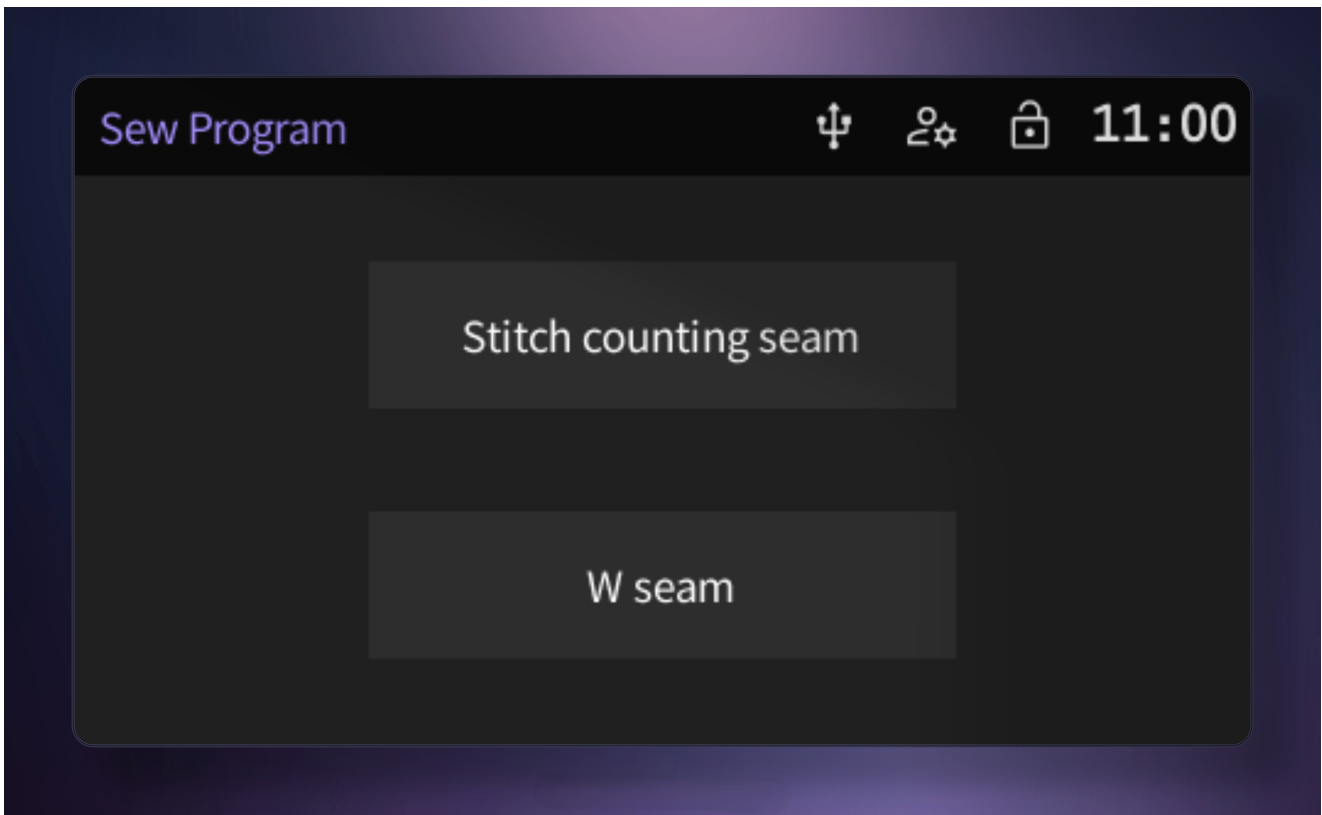
The **Select** button can activate the selected program.

The **Label** button can set a note name for the selected program.

The **Reset** button can restore the selected program to the factory default.

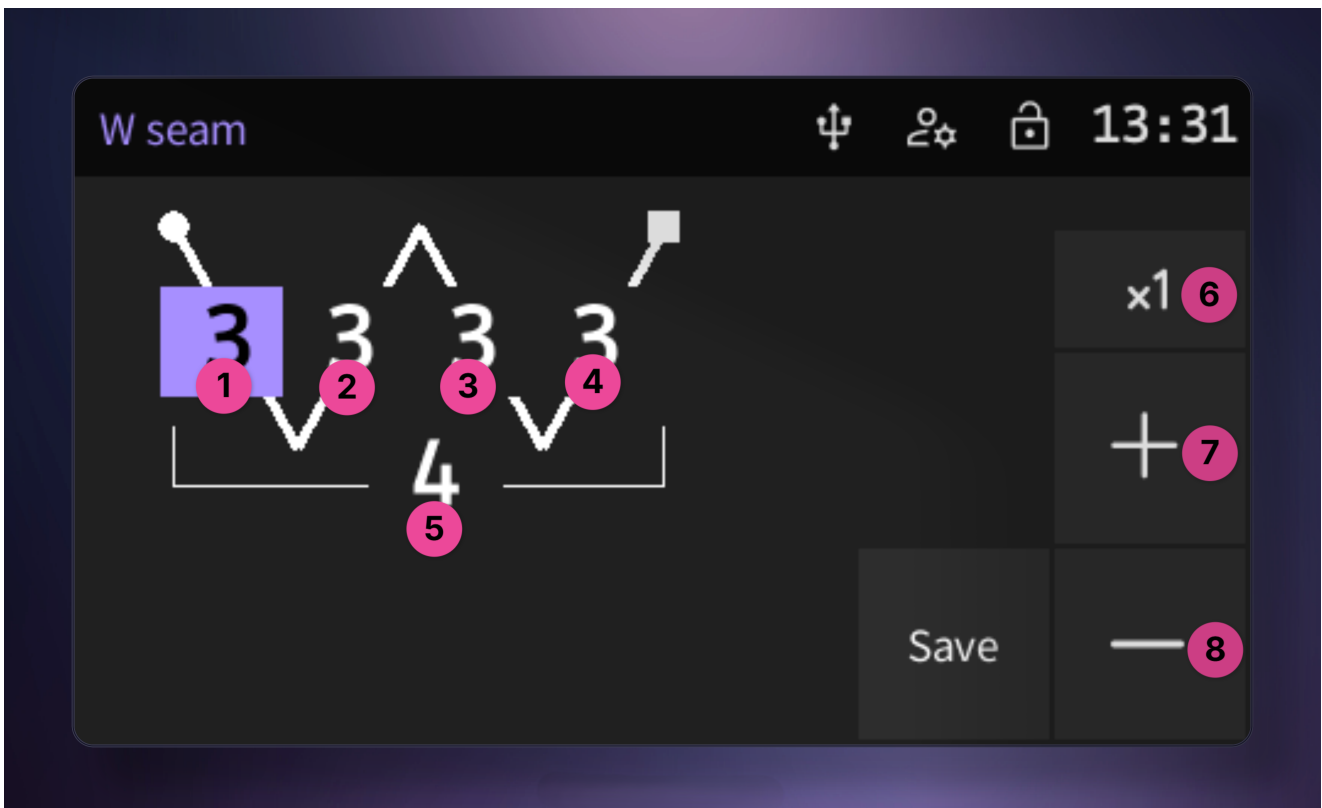
The **Edit** button can enter the next level interface to modify sewing programs P002 to P009. As mentioned above, for P003~P009, you must first select the type of program you want to save, either the program with one W seam or the program with stitch counting seam.

Sew Program type selection interface:



## Editing program with W seam

Touch W seam button at Sew Program type selection interface:



### Area Mark 1

Number of stitches for W seam section A

### Area Mark 2

Number of stitches for W seam section B

### Area Mark 3

Number of stitches for W seam section C

### Area Mark 4

Number of stitches for W seam section D

### Area Mark 5

Total number of segments, E

### Area Mark 6

Choose whether the addend or subtractor is 1 or 10

### Area Mark 7 and 8

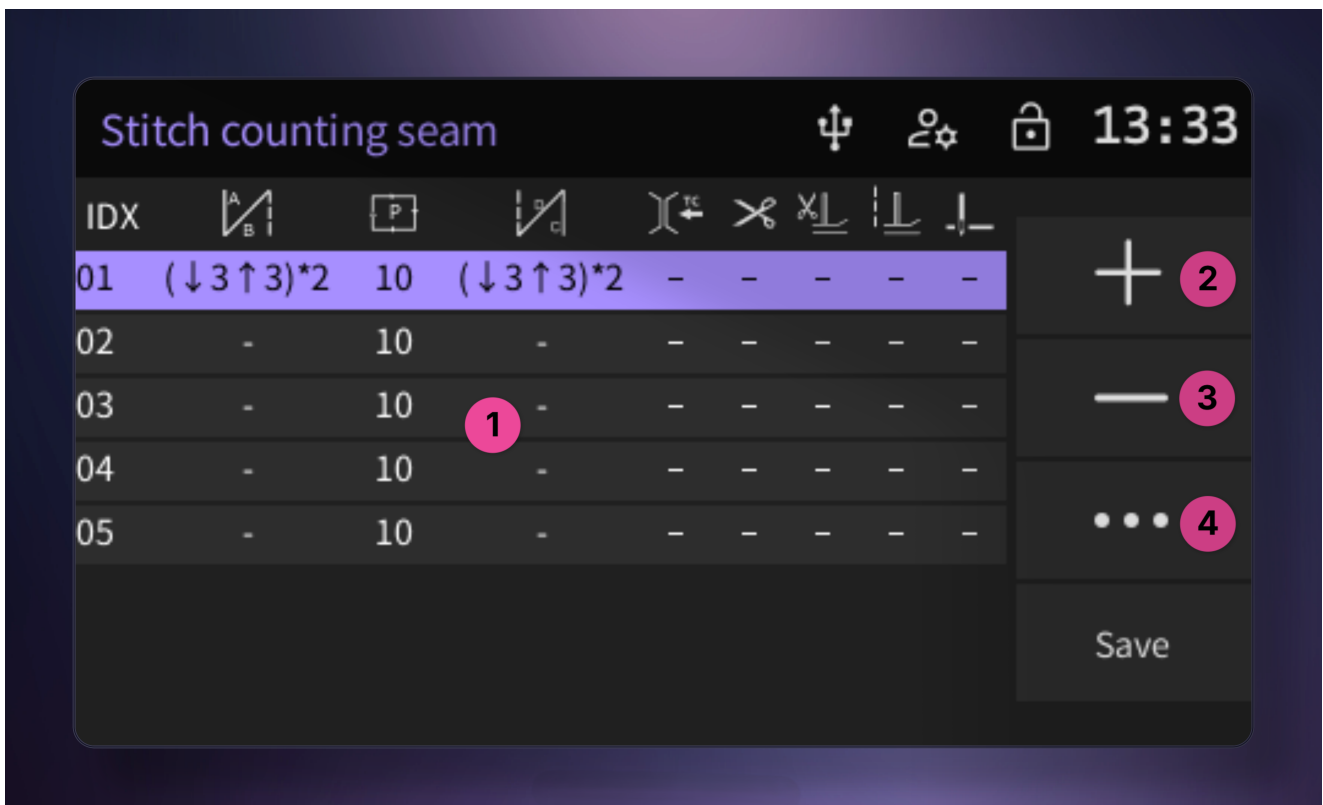
Operation: Add or subtract

### Save button

Touch to save the edited sewing program to the specified storage location

## Editing program with Stitch counting seam

Touch Stitch counting seam button at Sew Program type selection interface:



### Area Mark 1

List of seams included in the program, you can select one

### Area Mark 2 and 3

Add or delete a seam

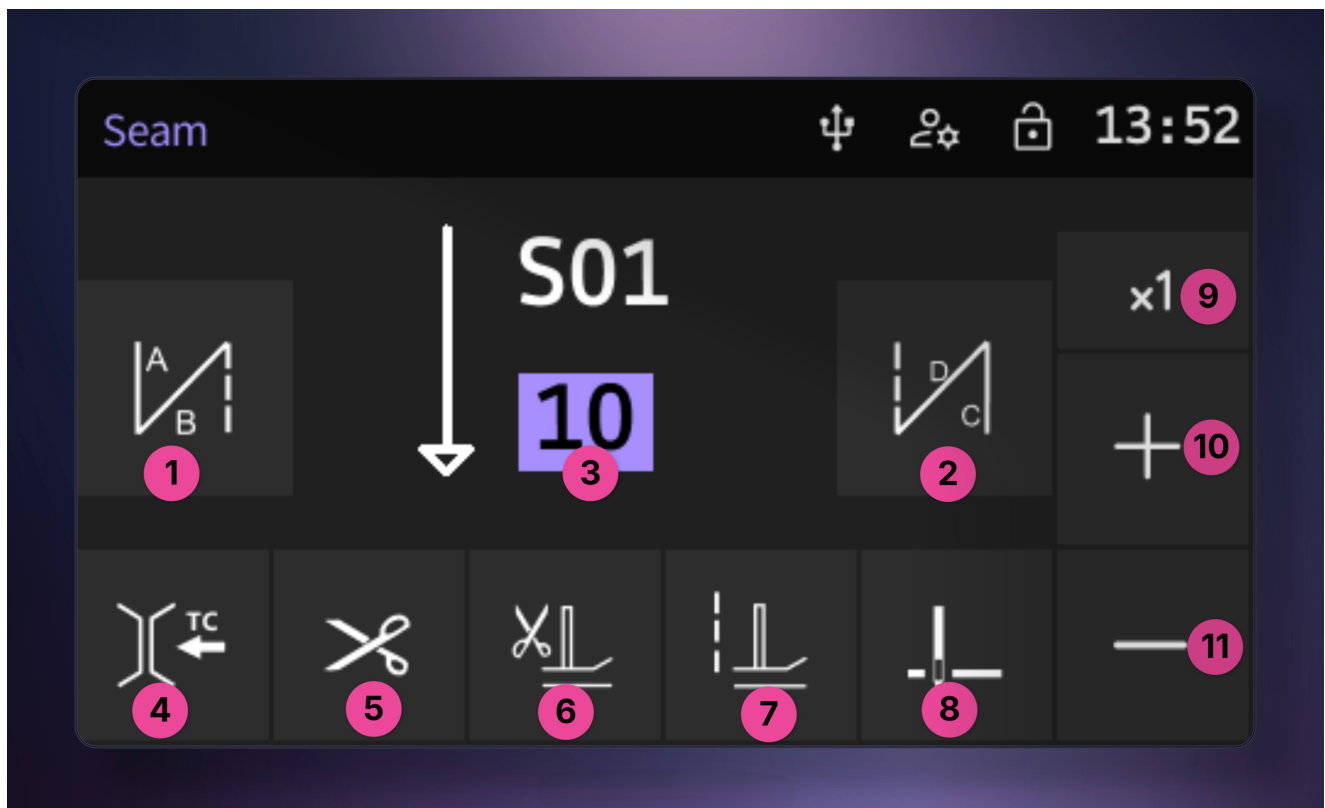
### Area Mark 4

Touch to enter the lower interface, the specific settings of the seam

### Save button

Touch to save the edited sewing program to the specified storage location

Touch Area Mark 4 to edit a seam:



### Area Mark 1

Enter the [Start backtack](#) editing interface

### Area Mark 2

Enter the [End backtack](#) editing interface

### Area Mark 3

Number of stitches

### Area Mark 4, 5, 6, 7, 8

Local functions related to the seam

## Area Mark 9

Choose whether the addend or subtrahend is 1 or 10

## Area Mark 10 and 11

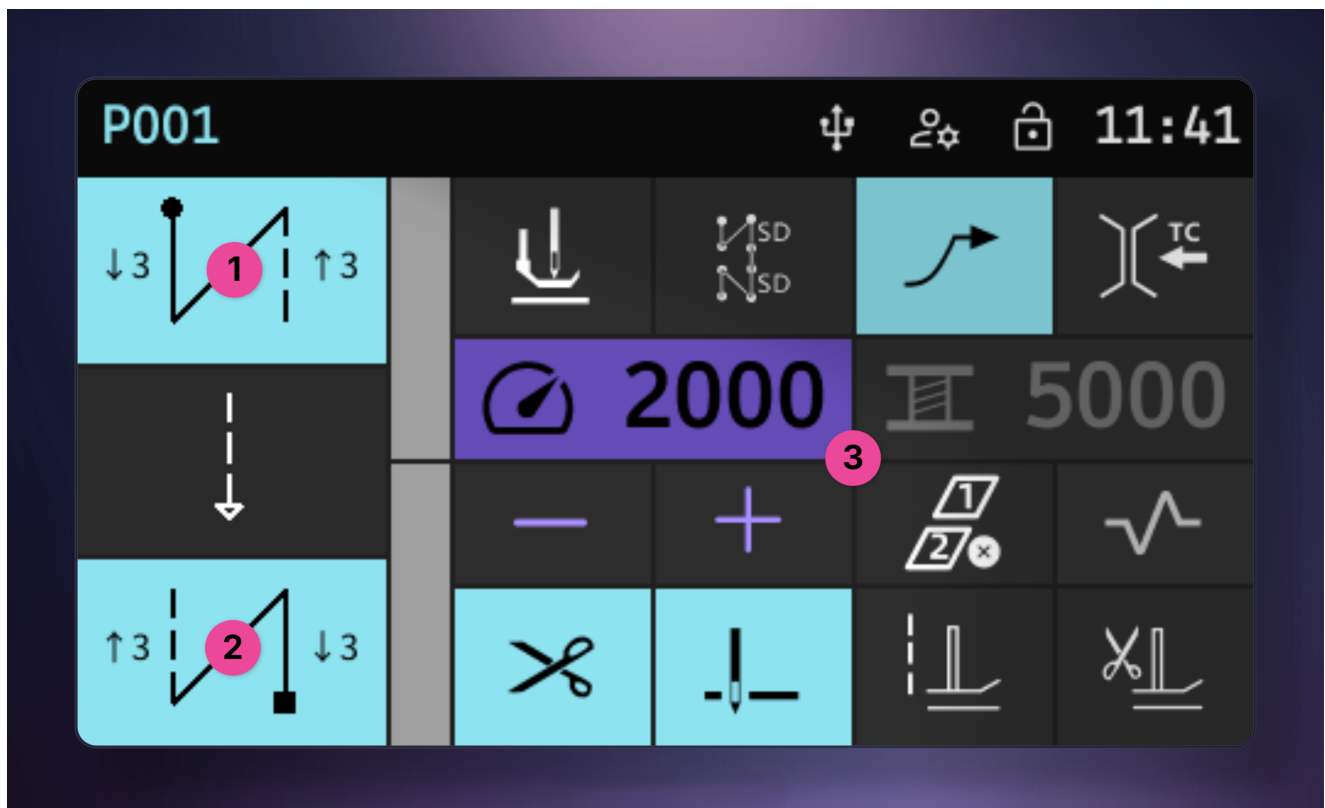
Operation: Add or subtract

When you are finished editing, press the **BtnReturn** to return to the previous interface.

## Editing the Activated program

### Free seam

Select a program with W seam, here we use P002 to show:



## Area Mark 1

Touch to enter Start backtack interface

## Area Mark 2

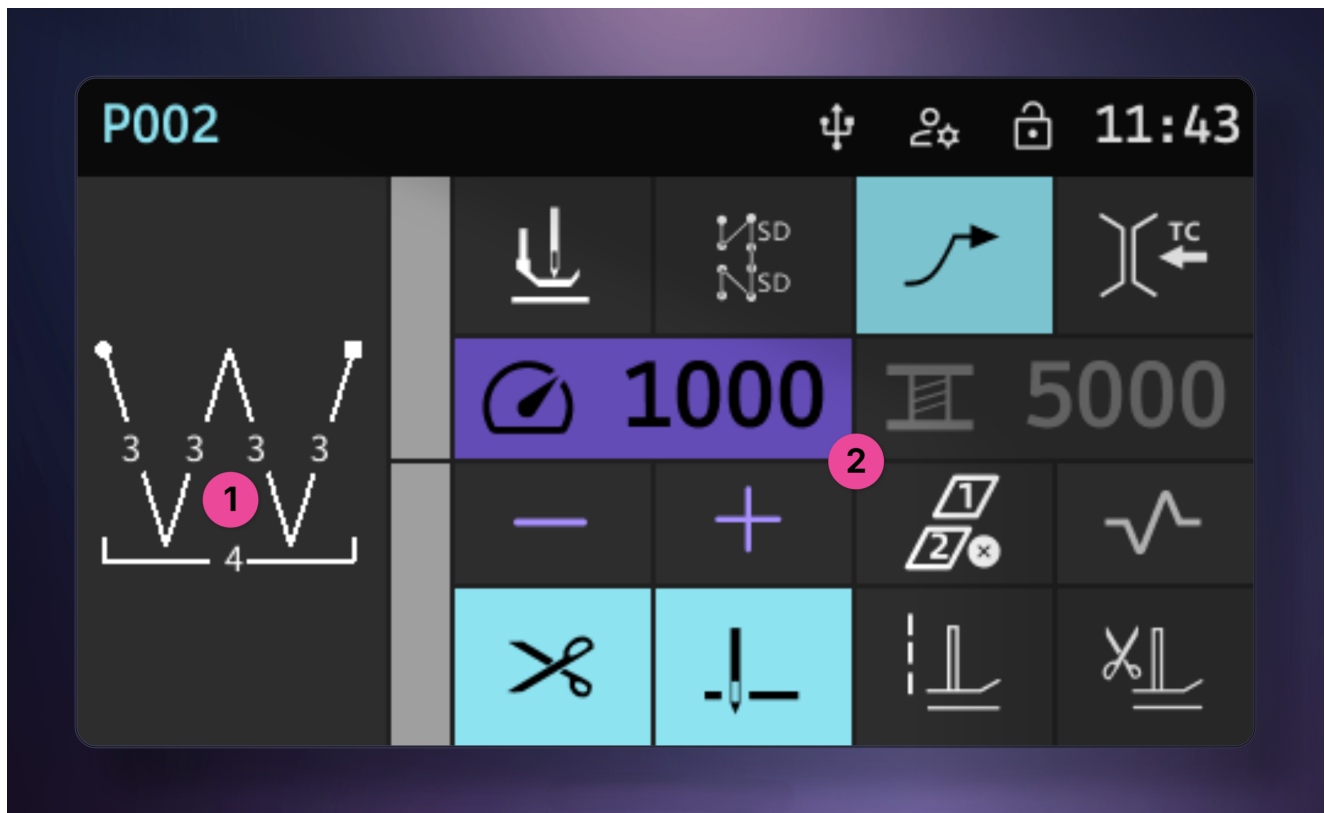
Touch to enter end backtack interface

## Area Mark 3

Adjust sewing speed, enable/disable functions

## W seam

Select a program with W seam, here we use P002 to show:



### Area Mark 1

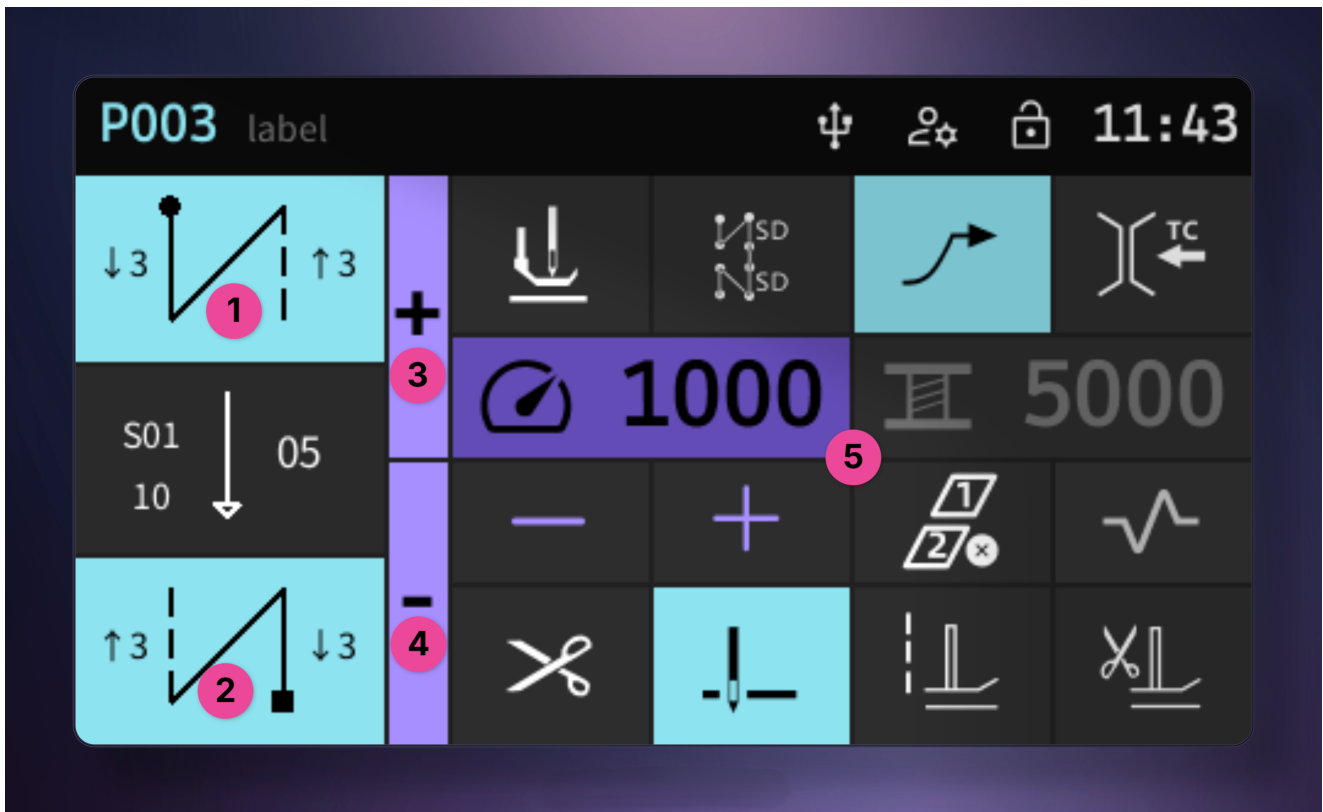
Touch to enter Start backtack interface

### Area Mark 2

Adjust sewing speed, enable/disable functions

## Stitch counting seam

Select a program with stitch counting seam, here we use P003 to show:



### Area Mark 1

Touch to enter start backtack interface

### Area Mark 2

Touch to enter end backtack interface

### Area Mark 3 and 4

Enter the next seam of the program or return to the previous seam of the program. If the number of needles in the next seam is 0, return to the first seam S01.

### Area Mark 5

Adjust sewing speed, enable/disable functions

## Thread clamp

### Thread clamp at seam start

Switch on at position set by **D07**, switch off at position set by **D08**.

Action only during the first stitch, reset after thread trim.

## Thread clamp at turning back

Switch on during turning back, the Max. permissible time is set by **T15** to protect from damage.

## Thread clamp at sewing foot lifting

Switch on during foot lifting, the Max. permissible time is set by **T15** to protect from damage.

## Quick reference

Index	Max	Min	Unit	Description
A10	1	0	-	Thread clamp 0 = Off; 1 = On
A29	3	0	-	Thread clamp option 0 = Thread clamp only at start of seam 1 = Thread clamp at start of seam and at turning back 2 = Thread clamp at start of seam and with foot elevation 3 = Thread clamp at start seam, at turning back and with foot elevation
T15	2000	1	ms	Thread clamp power on time with foot elevation or at turning back
D07	359	0	°	Position for activating of the thread clamp
D08	359	0	°	Thread clamp power off angle
O48	100	1	%	Duty cycle after full power

## Thread trim

### How it works?

Thread cutting procedure:

Thread cutting signal is switched on when the angle value **D03** has been reached, the switched off when the angle value **D04** . If the position is not reached because of a mechanical error, the thread cutter signal is switched off after 500ms for protect the magnet from damage.

## Quick reference

Index	Max	Min	Unit	Description
A06	1	0	-	Thread trim: 0 = Off; 1 = On
S07	300	150	spm	Thread trimming speed
A42	1	0	-	Short thread cutter
D03	359	0	°	Thread trimming power on angle
D04	359	0	°	Thread trimming power off angle
D19	359	0	°	Reverse of short thread trimming power on angle
D20	359	0	°	Reverse of short thread trimming power off angle
D21	359	0	°	Zero stitch length of short thread trimming power on angle
D22	359	0	°	Zero stitch length of short thread trimming power off angle

## Sewing foot lift

### Foot is raised

- On the seam: By pedal back **POSITION -1** or automatically with **A14** set to 1;
- After thread has been cut: By pedal back **POSITION -1** or **POSITION -2** or automatically with **A15** set to 1.

## Holding force of the raised foot

The foot lifting is raised by full activation, then it switches automatically to partial activation to reduce the load on the controller and the connected magnets.

The full activation period is set with **T07** and holding force during partial activation is set with **005**.

## Timeout release

In order to reduce heat generation, timed release can be set.

If parameter **006** is set to 1, the maximum time the foot lifter can keep raised is determined by parameter **007**.

## Delay time

When the sewing foot is the raised, in order to ensure that the sewing material is pressed tightly before the machine starts running, a time lag will be inserted after step the pedal forwards, which is controlled by parameter **T06**.

## Quick reference

This table summarizes which parameter should be used for sewing foot:

Index	Max	Min	Unit	Description
A09	1	0	-	Sewing foot lift 0 = Off; 1 = On
T05	500	1	ms	Lifting foot confirm delay time: to avoid unexpected foot lifting when step backward for trimming, the time is less and the sensitivity is higher.
T06	500	1	ms	Release lift foot delay time
T07	999	1	ms	Full power duration of foot lift solenoid
T10	200	1	ms	Pedal delay time adjustment for debounce
A14	1	0	-	Foot lift at sewing stop 0 = Off; 1 = automatic lifting the sewing foot during stop.

Index	Max	Min	Unit	Description
A15	1	0	-	Foot lift after thread trim 0 = Off 1 = automatic lifting sewing foot after thread trim, the foot will remain in their lifted position until a new seam begins or the pedal not at <b>POSITION -1</b> .
O05	100	1	%	Duty cycle after full power
O06	1	0	-	Foot lifting solenoid automatically power off 0 = Off 1 = On
O07	30	5	s	Hold time before foot lifting solenoid automatically power off

## Second stitch length

### Automation rules

Speed limit when long stitch length activated:

If parameter **033** set to 1, the speed is reduced down to parameter **S17** when long stitch length activated.

### Quick reference

Index	Max	Min	Unit	Description
A46	1	0	-	2nd Stitch length adjustment 0 = Off; 1 = On
O33	1	0	-	Speed limit during second stitch length adjustment 0 = no limit 1 = limit when big stitch length
S17	3500	150	spm	Limit speed for the big stitch length
O78	500	1	ms	Full power duration
O79	100	1	%	Duty cycle after full power

## Soft start

When beginning a new seam, within the number of soft start stitches **001**, speed is determined by the pedal and limited to the soft start speed **S08**.

### Quick reference

This table summarizes which parameter should be used for soft start:

Index	Max	Min	Unit	Description
A21	1	0	-	Soft start 0 = Off 1 = On
S08	500	200	spm	Speed of soft start
O01	10	1	stitches	Number of soft start stitches

## Bobbin thread monitor

Using Lower thread counter allows users to know the remaining thread amount.

### Quick start

Following steps:

1. Set an appropriate value for **019**, every time N stitches are sewn which set by this parameter, the counter value **044** increases by 1.
2. Set an appropriate value for **043**, this is a very variable value, which depends on the size of the bobbin and the thickness of the thread.
3. Choose when to throw a warning by setting **020**, immediately or after thread cutting.
4. Set **A12** to 1, enable the counter.
5. Refer to the beginning of this chapter **Bobbin Remaining Amount**, as the sewing, the remaining amount is counted down, when it reaches 0, the machine will stop, and the controller will throw a warning. A reset is needed if you want continue.

## How it works?

Here is a formula:

$$N_{\text{Remaining thread amount}} = O43_{\text{reset value of the bobbin thread counter}} - O44_{\text{bobbin thread counter value}}$$

## Quick reference

This table summarizes which parameter should be used for bobbin counter:

Index	Max	Min	Unit	Description
A12	1	0	-	Bobbin thread counter 0 = Off; 1 = On
O43	9999	1	-	Reset value of the bobbin thread counter
O19	200	1	stitches	Factor of bobbin counter
O44	9999	0	-	Bobbin thread counter value
O20	1	0	-	Choose when to throw warning if the counter reaches 0 0 = after thread cutting 1 = immediately

## Service counter

Using service counter allows users to remind regular mechanical maintenance.

### Quick start

Following steps:

1. Set an appropriate value for **A62**, every time N stitches are sewn which set by this parameter, the counter value **A63** increases by 1.
2. Set an appropriate value for **A61**, this is a very variable value, which depends on how often you want to maintain.
3. Set **A60** to 1, enable the counter.

4. Refer to the beginning of this chapter **Service Remaining Amount**, as the sewing, the remaining amount is counted down, when it reaches 0, the machine will stop, and the controller will throw a warning. A reset is needed if you want continue.

## How it works?

Here is a formula:

$$N_{\text{Remaining amount}} = A61_{\text{reset value of the service counter}} - A63_{\text{service counter value}}$$

## Quick reference

This table summarizes which parameter should be used for service counter:

Index	Max	Min	Unit	Description
A60	1	0	-	Service counter 0 = Off 1 = Activated
A61	9999	1	-	Reset value of service counter
A62	200	1	stitches	Factor of service counter
A63	9999	0	-	Counter value

## Motor

### Important

The maximum sewing speed depends on the machine class, you will find this speed in the operating documentation for the corresponding machine class.

## Holding force when idle

Enable this function by set **A54** to 1.

This function prevents unwanted wandering of the needle when the machine has stopped. The effect can be checked by turning the hand wheel.

While the function is in effect, the motor will maintain a certain force to *lock* in the current position. However, the *lock* here does not mean *standing still*, if the parameters are set improperly, or the motor is in a position where the external force is too large/small, the needle bar may vibrate up and down.

Holding force takes effect when idle:

- for a stop in the seam
- after the end of the seam

The maximum time the holding force can keep takes effect is determined by parameter **A66** :

Equal to 0

Holding force take effect always when stopped.

Not equal to 0

Holding force only take effect for a certain period of time when stop, and then the motor is released. At this time, the parameter value represents the effective time.

## Quick reference

This table summarizes which parameter should be used for motor:

Index	Max	Min	Unit	Description
S01	3500	150	spm	Maximum speed by pressing the pedal to the end position
A54	1	0	-	Holding force 0 = Holding force inactive; 1 = Holding force active
A66	9999	0	ms	Duration of holding motor 0 = Always activation N = Activation duration of holding motor
D01	359	0	°	Needle position after trim
D02	359	0	°	Lower needle position

## Thread tension

### Solenoid valve or electromagnet?

If tension is controlled by electromagnet not solenoid valve, you need to be careful when setting the value of **075**. Over permissible power on time, the electromagnet may burn out, thus an electromagnet with a small value of **075** is

protected from damage.

## How it works during thread cutting?

Thread tension procedure:

The thread tension power on when position is reached with **D13** and power off when position is reached with **D14** during thread cutting.

## Mode needle thread tension at sewing foot lift

When the foot is lifted, there are two cases: during sewing and after thread trimming, There are 4 options for the automatic mode of thread tension.

The mode is set by parameter **A27**:

- 0 = tension is not lifted;
- 1 = tension is lifted as the foot is lifted during sewing;
- 2 = tension is lifted as the foot is lifted after thread trim;
- 3 = tension is lifted as the foot is lifted during sewing and after trim.

## Automation rules for additional thread tension

Automatic activate additional thread tension is associated with three situations:

- Stroke
- Backtack at seam start
- Backtack at seam end

### How automation rules work

If the second sewing foot stroke is switched on, the additional thread tension is automatically activated, when the stroke has returned to the normal position, the additional thread tension has also returned to normal settings.

During bartack at seam begin, the additional thread tension is automatically activated, when the bartack completes, the additional thread tension has also returned to normal settings.

During bartack at seam end, the additional thread tension is automatically activated, when the bartack completes, the additional thread tension has also returned to normal settings.

The mode is set by parameter **A28**, you can use the following table to quickly check the parameter values you need to set:

Value	Stroke	Start Backtack	End Backtack
0	Off	Off	Off
1	On	Off	Off
2	Off	On	Off
3	On	On	Off
4	Off	Off	On
5	On	Off	On
6	Off	On	On
7	On	On	On

## Quick reference

This table summarizes which parameter should be used for tension:

Index	Max	Min	Unit	Description
A27	3	0	-	Mode for lifting the tension during active sewing foot lift
A28	1	0	-	Auto mode for additional thread tension
D13	359	0	°	Thread tension power on angle
D14	359	0	°	Thread tension power off angle
O49	500	1	ms	Full activation time of main thread tension
O50	100	1	%	Holding force of main thread tension
O75	9999	0	ms	Thread tension power on time 0 = always other = Automatically release after the O75 set time
O86	500	1	ms	Full activation time of additional thread tension
O87	100	1	%	Holding force of additional thread tension

Index	Max	Min	Unit	Description
O88	1	0	-	Type of thread tension 0 = Electromagnet; 1 = Solenoid valve.

## Foot stroke

### Automation rules

The following rules apply to the stroke height:

#### Speed limit during quick stroke adjustment

If parameter **A35** set to 1, when 2nd sewing foot stroke is activated,

the speed is reduced down to the desired value of 2nd sewing foot stroke which set by **S15**.

#### Number of stitches 2nd stroke off

if **A32** is not 0, when switching to 2nd sewing foot stroke, after sewing

N stitches set by **A32**, the second sewing foot stroke is automatically deactivated.

### Quick reference

This table summarizes which parameter should be used for stroke:

Index	Max	Min	Unit	Description
S09	3500	500	spm	The stroke height knob type is switch: limit speed for 1th stroke height
S10	3500	500	spm	The stroke height knob type is potentiometer: limit speed for low stroke height
S11	3500	500	spm	The stroke height knob type is switch : limit speed for 2th stroke height
S12	3500	500	spm	The stroke height knob type is switch : limit speed for 3th stroke height

Index	Max	Min	Unit	Description
S13	3500	500	spm	The stroke height knob type is switch : limit speed for 4th stroke height
S14	3500	500	spm	The stroke height knob type is potentiometer: limit speed for high stroke height
S15	3500	500	spm	Limit speed for the maximum stroke height
A32	99	0	stitches	Number of stitches for automatic switch-off 2nd foot stroke 0 = manual deactivated; N = number of stitches after which the second foot stroke is automatically deactivated.
A35	1	0	-	Speed limit during quick stroke adjustment: 0 = no limit; 1 = limit
A45	1	0	-	2nd Stroke adjustment 0 = Off; 1 = On
O85	2	0	-	Type of stroke adjustment sensor: 0 = No; 1 = Switch; 2 = Potentiometer
O76	500	1	ms	Full power duration
O77	100	1	%	Duty cycle after full power

## Safety Sensor

Tilt safety/Finger protection/Hook cover protection

Index	Max	Min	Unit	Description
O28	1	0	-	Finger protection function 0 = Off; 1 = On

Index	Max	Min	Unit	Description
O29	1	0	-	Hook cover protection function 0 = Off; 1 = On
O31	1	0	-	Tilt safety switch function 0 = Off; 1 = On
O32	1	0		Polarity of the tilt safety switch 0 = Normal Close 1 = Normal Open
T09	1000	1	ms	Safety switch alarm confirm delay time, the time is less and the sensitivity is higher. Too high sensitivity will produce fake fault report

## Turn back

Set **A13** to 1 to enable the turn back function, this function helps remove the materials and prevent the needle from scratching the fabric.

The function Turn back is performed after trimming. When the stop position is reached, after the delay time set by **T12**, Then it runs in reverse direction at positioning speed set by **S16** according to the needle position set by **O35**.

## Quick reference

This table summarizes which parameter should be used for turn back:

Index	Max	Min	Unit	Description
A13	1	0	-	Turn back 0 = Off; 1 = On
O35	359	0	°	Needle position after turn back
S16	500	50	spm	Positioning speed of turn back
T12	1000	1	ms	Lag time, after which motor restarts and runs in reverse direction

# Needle cooling

Needle cooling is used to slow down the temperature rise of needle, and to avoid damage to the sewing material and breakage of the upper thread.

## How it works?

Above the speed set by **S18**, the needle cooling start;

Below the speed set by **S18**, the needle cooling does not stop immediately, needle cooling to continue until the time setted by **T16** has elapsed.

During the follow-up time, if the speed exceeds **S18** again, the needle cooling start again.

## Quick reference

This table summarizes which parameter should be used for needle cooling:

Index	Max	Min	Unit	Description
A48	1	0	-	Needle cooling function 0 = Off; 1 = On
S18	4500	100	spm	Needle cooling start speed
T16	10	0	s	Needle cooling follow up time
O93	999	1	ms	Full power duration
O94	100	1	%	Duty cycle after full power

# Seam center guide

## Automation rules

Automatic lifting seam center guide is associated with three situations:

- Sew Foot
- Backtack(start or end tack) and reverse
- Stroke

## How automation rules work

If the second sewing foot stroke is switched on, the seam center guide is automatically raised up, when the stroke has returned to the normal position, the seam center guide has also returned to normal settings.

During the sewing of the bartack/reverse, the seam center guide is automatically raised up, when the bartack/reverse completes, the seam center guide has also returned to normal settings.

If the second sewing foot stroke is switched on, the seam center guide is automatically raised up, when the stroke has returned to the normal position, the seam center guide has also returned to normal settings.

The mode is set by parameter **A51**, you can use the following table to quickly check the parameter values you need to set:

Value	Foot	Bartack/reverse	Stroke
0	Off	Off	Off
1	On	Off	Off
2	Off	On	Off
3	On	On	Off
4	Off	Off	On
5	On	Off	On
6	Off	On	On
7	On	On	On

## Quick reference

This table summarizes which parameter should be used for seam center guide:

Index	Max	Min	Unit	Description
A47	1	0	-	Seam center guide 0 = Off; 1 = On

Index	Max	Min	Unit	Description
A51	3	0	-	Auto mode for seam center guide
O89	500	1	ms	Full power duration
O90	100	1	%	Duty cycle after full power

## Puller

### Automation rules

Automation rules allow puller to automate actions while lifting or bartack.

How automation rules work:

- During lifting, raising of puller when lifting the sewing foot.
- During bartack, raising of puller when sewing the start/end bartack.
- During backwards, raising of puller when reverse button pressed.
- The puller is to be switched on via a button, if the puller is switched off, it is always up, if the button is pressed, the puller goes down.

### Quick reference

This table summarizes which parameter should be used for puller:

Index	Max	Min	Init	Description
A89	1	0	-	Function enable: 0 = Off; 1 = On
A64	255	0	stitches	Delay stitches after foot down 0 = foot lifter goes down, the puller goes down immediately; N = At seam start, the puller goes down after sew N stitches; in the seam, puller go up/down with sewing foot lifter
O89	500	1	ms	Full power duration
O90	100	1	%	Duty cycle after full power

# Electronic hand wheel

This function is only effective when the machine stops.

## Quick reference

This table summarizes which parameter should be used for electric handwheel:

Index	Max	Min	Unit	Description
A23	1	0	-	Electronic handwheel 0 = Off; 1 = On
A43	1	0	-	Direction of rotation of electronic handwheel 0 = Right; 1 = Left

# Thread wiper

## How it works?

Thread wiper has two different action modes:

### Upper thread wiper function

Set **A08** to 1 to enable this function.

When thread cutter is completed and the time set by **T03** is delayed, the wiper will switch on, it will switch off after the time set by **T04**.

### Lower thread wiper function

Set **A08** to 2 to enable this function.

When thread cutter is completed, while lifting the foot for the first time, the wiper will switch on, it will switch off after the time set by **T04**.

## Quick reference

This table summarizes which parameter should be used for wiper:

Index	Max	Min	Unit	Description
A08	2	0	-	Thread wiper function 0 = Off; 1 = Upper thread; 2 = Lower thread
T03	200	1	ms	Wiper waiting time
T04	200	1	ms	Wiper action time

## Daily piece counter

Index	Max	Min	Unit	Description
A11	1	0	-	Daily piece counter 0 = Off; 1 = Activated
O45	999	1	stitches	Min number of stitches for counter plus 1
O46	99	1	-	Min number of thread trim times for counter plus 1
O47	9999	0	-	Value of daily piece counter

## Controller, other

Index	Max	Min	Unit	Description
O17	1	0	-	Reset: error message record
O51	1	0	-	Reset: parameter
O52	1	0	-	Reset: machine ZERO
A59	1	0	-	Reset: static data
O66	1	0	-	Reset: all above

# Input configuration

Input ports allow you to connect devices that send signals to controller. These devices include buttons, optoelectronics, potentiometers, proximity sensor, and more. There are two main categories of input ports: analog and digital.

Each input port is flexible. In most cases, you can freely configure the mode of each port according to your actual wiring.

## Important

Make sure that two input ports are not configured for the same mode.

Depending on the model, some mode may not be available.

## Input Mode Code List

Here is the input mode code list:

- 0 = No function;
- 1 = Manual bartack;
- 2 = Forward correction;
- 3 = Backward correction;
- 4 = Forward correction at stop, reverse at running;
- 5 = Backward correction at stop, reverse at running;
- 6 = Quick toggle stroke;
- 7 = Enable/unable bartack at seam start/end;
- 8 = Second stitch length;
- 9 = Additional thread tension;
- 10 = Pause;
- 11 = Thread a needle;
- 12 = Toggle seam center guide raise up/down;
- 13 = Tilt switch;
- 14 = Up thread broken sensor;
- 15 = Eye protection sensor;
- 16 = Slide monitoring sensor;
- 17 = Toggle sewing foot lifter raise up/down;
- 18 = lifting sewing foot via the knee switch;

- 19 = Lubricating oil level sensor(Digital type);
- 20 = Toggle puller raise up/down;
- 21 = Reset bobbin counter;
- 22 = Simulate electronic handwheel rotation(forwards);
- 23 = Simulate electronic handwheel rotation(backwards);
- 24 = Toggle sewing direction;
- 25 = Toggle the clamp function on and off;
- 26 = Block Quick Keys;
- 27 = Remaining thread monitor sensor(Digital type);
- 100 = Sewing foot stroke knob potentiometer;
- 101 = Sewing foot height sensor
- 102 = Orthogonal encoder CHA for electronic handwheel;
- 103 = Orthogonal encoder CHB for electronic handwheel;
- 104 = Lubricating oil level sensor(Analog type);

 **Tip**

Functions with codes greater than 100 needs special input ports, such as analog.

## Quick reference

This table summarizes which parameter should be used for input configuration:

Index	Max	Min	Unit	Description
A04	199	0	-	Mode Input-01
A05	199	0	-	Mode Input-02
A36	199	0	-	Mode Keypad-Key1
A37	199	0	-	Mode Keypad-Key2
A38	199	0	-	Mode Keypad-Key3
A39	199	0	-	Mode Keypad-Key4
A40	199	0	-	Mode Keypad-Key5

Index	Max	Min	Unit	Description
A41	199	0	-	Mode Keypad-Key6
A68	199	0	-	Mode Keypad-Key7
A81	199	0	-	Mode Input-03
A82	199	0	-	Mode Input-04
A83	199	0	-	Mode Input-05
A84	199	0	-	Mode Input-06
A85	199	0	-	Mode Input-07
A86	199	0	-	Mode Input-08
A87	199	0	-	Mode Input-09
A88	199	0	-	Mode Input-10

## Output configuration

Output ports allow the controller to drive components on the machine. These components mainly include various types of electromagnets and solenoid valves.

Each output port is flexible. In most cases, you can freely configure the mode of each port according to your actual wiring.

### Important

Make sure that two output ports are not configured for the same mode.

Depending on the model, some mode may not be available.

## Output Mode Code List

Here is the output mode code list:

- 0 = No function;
- 1 = Thread cutter;
- 2 = Thread tension;
- 3 = Thread clamp;
- 4 = Reverse;

- 5 = Sewing foot lifter;
- 6 = Stroke;
- 7 = Additional thread tension;
- 8 = Thread wiper(upper);
- 9 = Second stitch length;
- 10 = Needle cooling;
- 11 = Additional cutter for short thread cutter machine;
- 12 = Seam center guide;
- 13 = Zero stitch length for short thread cutter machine;
- 14 = Auto corner for 2-needle machine;
- 15 = Puller;
- 16 = Thread wiper(lower);

## Quick reference

This table summarizes which parameter should be used for output configuration:

Index	Max	Min	Unit	Description
A71	13	0	-	Mode Output-01
A72	13	0	-	Mode Output-02
A73	13	0	-	Mode Output-03
A74	13	0	-	Mode Output-04
A75	13	0	-	Mode Output-05
A76	13	0	-	Mode Output-06
A77	13	0	-	Mode Output-07
A78	13	0	-	Mode Output-08
A79	13	0	-	Mode Output-09
A80	13	0	-	Mode Output-10

# Multitest

## ⚠ Caution

Please set these options carefully!

Risk of injury from moving, cutting and sharp parts!

When the endurance test starts, the machine will run automatically until the test time which set by **025** is reached.

## Quick reference

This table summarizes which parameter should be used for multitest:

Index	Max	Min	Unit	Description
O23	60	1	s	Running time of an endurance cycle
O24	60	1	s	Standby time of an endurance cycle
O25	720	1	h	Total endurance time
O26	1	0	-	Endurance running function 0 = Off; 1 = On, the machine will run automatically

## Assemble

## ⚠ Warning

If certain parameters in this category are set incorrectly, the machine may have unexpected problems.

Index	Max	Min	Unit	Description
O56	4095	0	-	The maximum pedal input when <b>POSITION 2</b> , value > O57
O57	4095	0	-	The pedal input of border between <b>POSITION 2</b> and <b>POSITION 1</b> , O56 < value O58
O58	4095	0	-	The pedal input of border between <b>POSITION 1</b> and <b>POSITION 0</b> , O57 < value O59

Index	Max	Min	Unit	Description
O59	4095	0	-	The pedal input of border between <b>POSITION 0</b> and <b>POSITION -1</b> , O58 < value O60
O60	4095	0	-	The pedal input of border between <b>POSITION -2</b> and <b>POSITION -1</b> , O59 < value O61
O61	4095	0	-	The minimum pedal input when <b>POSITION -2</b> , value < O60
O63	5	0	-	The relation of pedal input and speed: 0 = linear; 1 = 2 lines; 2 = curve(start slowly, end fast); 3 = curve(start fast, end slowly); 4 = S curve(start slowly, middle fast, end slowly); 5 = S curve(start fast, middle slowly, end fast)

## Warnings, error and information messages

The exception messages of SilverStar Sewing Control System is divided into three groups, as shown in the following table:

Level	Acronym	Description
Error	Err	Switch off the controller and eliminate the problem
Warning	Wrn	Eliminate the state that caused to the warning, the controller will normally work
Information	Inf	Work can be continued, only exception message needs to be confirmed

# Error message list

Level	Code	Error description	Solution
Error	101	AC power supply voltage is too high	Check the ac voltage; Replace the controller.
Error	103	Bus voltage is too high	Check the brake circuit, replace the brake resistor; Replace the controller.
Error	106	The bus current is too high	Check the motor encoder connection; Check if the right MACHINE ID is seted; Replace the controller
Error	108	Overload, the current command of main motor exceeds the maximum value	The shaft is blocked; The material is too thick.
Error	109	The main motor starts failed	Restart the controller from where the sewing material is thinner; The shaft is blocked; The material is too thick.
Error	110	The synchronizer signal is not detected	Check the synchronizaer signal; The shaft is blocked; The material is too thick.
Error	111	Motor UVW signal is abnormal	Check the UVW signal; Replace motor encoder
Error	112	The motor synchronization signal cannot be detected for a long time after step on the pedal.	Check the synchronizaer signal; Replace motor encoder.
Error	113	The solenoid current is too high	Check the solenoid; Replace the controller or solenoid;
Error	114	Abnormal value of motor angle	SCheck the motor encoder connection; Check the hall sensor;

Level	Code	Error description	Solution
Error	126	The paramter synchronization is failed	Check the panel connection; Restart the control box.
Error	127	The panel is reconnected when some special mode	Restart the controlbox
Error	128	Parameters verified failed	Restart the controlbox; Update software.
Error	130	Parameters version verified failed	Update the software of controlbox or panel.
Error	191	Controller upgrade files data error: wrong file	Update software
Error	192	Controller upgrade files data error: wrong page	Copy the upgrade files and update again
Error	193	Controller upgrade files data error: verification failed	Copy the upgrade files and update again
Error	194	Controller upgrade files data error: wrong size	Copy the upgrade files and update again
Error	195	Controller upgrade files data error: start address	Copy the upgrade files and update again
Error	196	Controller upgrade files data error: model not match	Copy the upgrade files and update again
Error	197	Controller upgrade files not exist	Copy the upgrade files and update again
Error	198	Communication timeout when upgrade the controller	Check wire connection and update again
Error	199	No USB drive detected	Reinsert the USB disk and update again
Error	181	Panel upgrade files data error: wrong file	Update software

Level	Code	Error description	Solution
Error	182	Panel upgrade files data error: wrong page	Copy the upgrade files and update again
Error	183	Panel upgrade files data error: verification failed	Copy the upgrade files and update again
Error	184	Panel upgrade files data error: wrong size	Copy the upgrade files and update again
Error	185	Panel upgrade files data error: wrong start address	Copy the upgrade files and update again
Error	186	Panel upgrade files data error: model not match	Copy the upgrade files and update again
Error	187	Panel upgrade files not exist	Copy the upgrade files and update again
Error	188	Communication timeout when upgrade the panel	Check wire connection and update again
Error	189	No USB drive detected	Copy the upgrade files and update again

## Warning message list

Level	Code	Error description	Solution
Warning	1	Pedal warning	The pedal must be released when switching on; The pedal type must be set correctly when using standing pedal; Replace the pedal.
Warning	2	Tilt switch warning	The warning will be cleared when the machine is back to the normal position; Check the tipping sensor on the machine
Warning	3	Shortcut warning	The short key must be released when switching on

Level	Code	Error description	Solution
Warning	4	Shortkey warning	The short key must be released when switching on
Warning	5	Bobbin thread monitor	Replace the bobbin, press reset key to clear warning
Warning	6	Upper thread breaking warning	The upper thread is broken; Check the sensor of upper thread.
Warning	7	Service counter warning	Make a service maintenance, press reset key to clear warning
Warning	8	Eye protection monitoring	Put eye protection cover plate back in place; Check the sensor of eye protection.
Warning	9	Slide monitoring	Close the hook cover plate; Check the sensor of slide monitoring.

## Information message list

Level	Code	Error description	Solution
Information	50	Oil level is below the minimum level marking	Maintenance necessary, see the service instructions for the machine to lubricating the machine

## Update firmware

If the controller needs to be upgraded, you can update it by a USB flash drive. There are two firmware, one for the control box, another one for the panel. You can do it by following steps:

1. Prepare a USB flash drive with FAT32 file format, unzip the firmware package to the root directory of the USB flash drive.
2. Switch off the controller, insert the USB flash drive, then press **BtnLock** when switching on the controller.

- 3.** If there are available update files, the information will be displayed. Select the item, click start button to update. Wait for progress reach 100%.
- 4.** Switch off the controller, unplug the USB flash drive, then restart.